

حمل الآن

مجاناً وحصرياً

امتحانات رقم (1)

الترم الاول



Final Assessment from the School Book



First Group :

► Choose the correct answer from the given ones :

1 What is the multiplicative inverse of the number $-\sqrt{2}$ in its simplest form ?

- (a) $\sqrt{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\frac{\sqrt{2}}{2}$ (d) $-\frac{\sqrt{2}}{2}$

2 What is the result of $\sqrt[3]{2} - 2\sqrt[3]{\frac{1}{4}}$?

- (a) 0 (b) 1 (c) $\sqrt[3]{2}$ (d) 2

3 If $x^3 + y^3 = 20$, $x^2 - xy + y^2 = 4$, what is the value of $2x + 2y$?

- (a) 5 (b) 10 (c) 15 (d) 20

4 What is the solution set of the equation $x^2 - 4x + 3 = 0$ in $\mathbb{R}$?

- (a) $\{1, 3\}$ (b) $\{-1, -3\}$ (c) $\{1, -3\}$ (d) $\{-1, 3\}$

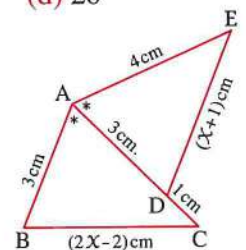
5 If $a + b = 2\sqrt{5}$, $c - d = \sqrt{5}$, what is the value of $ac - ad + bc - bd$?

- (a) $\sqrt{5}$ (b) $3\sqrt{5}$ (c) 10 (d) 20

6 In the given figure :

What is the value of x ?

- (a) 1 (b) 2
(c) 3 (d) 4



7 What is the number of sides of a polygon whose sum of measures of its interior angles is 1980° ?

- (a) 10 (b) 11 (c) 12 (d) 13

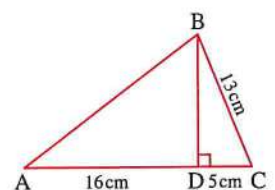
8 If the lower limit of an interval is 15 and its center is 17.5 , what is the length of the interval ?

- (a) 5 (b) 10 (c) 20 (d) 25

9 In the given figure :

What is the length of $\overline{AB}$?

- (a) 12 cm (b) 25 cm
(c) 20 cm (d) 16 cm



Second Group :

► Answer the following questions :

- 1 If $X =]-4, 1]$, $Y = [-2, 5[$, find the following in the form of an interval using the number line :

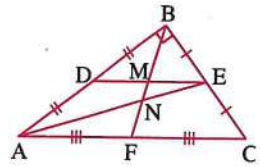
① $X \cap Y$ ② $X \cup Y$ ③ $Y - X$

- 2 Simplify the expression $\frac{(\sqrt{3})^{2n+3}}{(\sqrt{2})^{1-n} \times (\sqrt{6})^{n-1}}$ to its simplest form , then find the value of the result when $n = 0$

- 3 In the given figure :

If the length of $\overline{DE} = 6$ cm ,

find with proof : The length of $\overline{MN}$

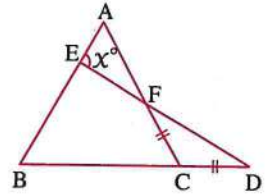


- 4 In the given figure :

ABC is an equilateral triangle ,

$\overline{AC} \cap \overline{ED} = \{F\}$, $CF = CD$

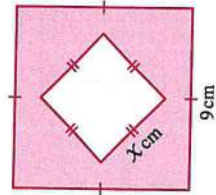
Find with proof : The value of $\angle X$



- 5 Factorize each of the following :

① $4x^2 - 25$ ② $b^3 - 8$ ③ $4x^2 + 14x - 30$

- 6 Express the area of the coloured part in the given figure as a product of two factors.



- 7 Find the arithmetic mean of the following frequency distribution :

Intervals	5 -	15 -	25 -	35 -	Total
Frequency	6	8	k	2	20

Final Exam Models



Exam

1

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 $\mathbb{R} = \dots\dots\dots$

- (a) $\mathbb{Q} \cup \mathbb{Q}$ (b) $\mathbb{Q} \cap \mathbb{Q}$ (c) $\mathbb{N} \cup \mathbb{Z}$ (d) $\mathbb{Z} \cup \mathbb{Q}$

2 What is the value of $\sqrt{3} + \sqrt{3}$?

- (a) $\sqrt{3}$ (b) $2\sqrt{3}$ (c) $\sqrt{2}$ (d) 3

3 Which of the following polynomials represents a perfect square ?

- (a) $x^2 + 25 + 5x$ (b) $25 - 10x - x^2$
(c) $\frac{1}{9}x^2 + 2xy + 9y^2$ (d) $4x^2 + 12xy - 9y^2$

4 $x^2 - ax + bx - ab = \dots\dots\dots$

- (a) $(x - a)(x - b)$ (b) $(x - a)(x + b)$
(c) $(x + a)(x - b)$ (d) $(x + a)(x + b)$

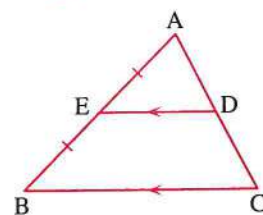
5 If $x^2 - 3x + c$ is factorizable , then c can be equal to

- (a) 1 (b) 2 (c) 4 (d) 6

6 In the given figure :

What is the ratio of the length of $\overline{AD}$ to the length of $\overline{DC}$?

- (a) 1 : 1 (b) 1 : 2
(c) 2 : 1 (d) 1 : 3



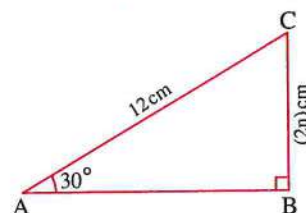
7 What is the measure of the exterior angle of an equilateral triangle?

- (a) 60° (b) 90° (c) 120° (d) 180°

8 In the given figure :

What is the value of n ?

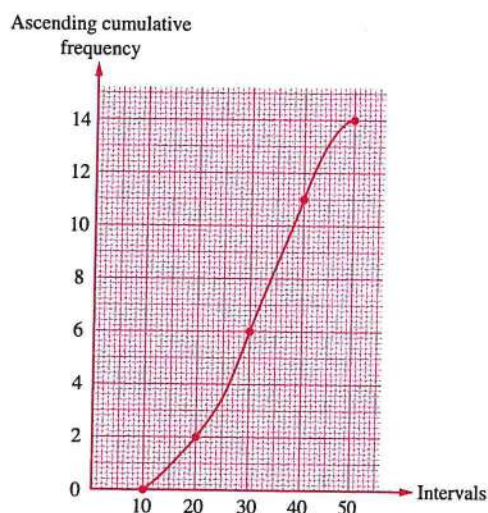
- (a) 3 (b) 6
(c) 9 (d) 12



- 9 The given figure represents the ascending cumulative frequency curve of the number of colored pencils owned by students in the first grade primary.

How many students own less than 30 pencils ?

- (a) 2
(b) 4
(c) 6
(d) 8



Second Group :

► Answer the following questions :

- 1 Simplify to the simplest form :

① $\sqrt{50} + \sqrt{8}$

② $\frac{(\sqrt{7})^{-4} \times (\sqrt{7})^{-3}}{(\sqrt{7})^{-9}}$

- 2 If $3^x = 7$, find the value of each of :

① 3^{x-2}

② 3^{x+2}

- 3 [a] Find the value of the following using factorization by taking out the greatest common factor : $11 \times 123 + 11 \times 35 - 11 \times 58$

[b] Factorize each of the following completely :

① $12a^2 - a - 6$

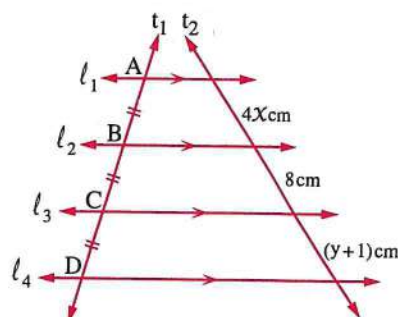
② $x^3 + 1$

- 4 In the given figure :

$l_1 \parallel l_2 \parallel l_3 \parallel l_4$

The lines t_1 and t_2 are two transversals

Find : the value of each of x and y



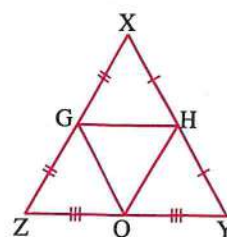
- 5 In the given figure :

$\triangle XZY$ is a triangle ,

H , G and O are the midpoints of $\overline{XY}$, $\overline{XZ}$ and $\overline{ZY}$ respectively ,

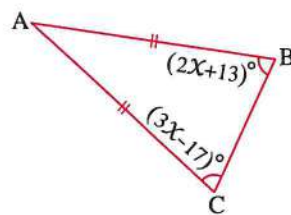
If the perimeter of $\triangle HGO = 18$ cm

Find : The perimeter of $\triangle XZY$



6 In the given figure :

Find the measure of each angle of the triangle ABC



7 The following table shows the mobile phone usage times for thirty university students on one day :

Time (minute)	120 –	150 –	180 –	210 –	240 –	270 –
Number of students	3	4	5	6	8	4

Estimate the mode for mobile usage times using the frequency histogram.

Exam 2

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 $\sqrt{10} \approx \dots\dots\dots$

- (a) 2.99 (b) 3.71 (c) 3 (d) - 3.2

2 What is the value of $\frac{\sqrt{63}}{\sqrt{7}}$?

- (a) 3 (b) $\sqrt{3}$ (c) 9 (d) ± 3

3 If $x + 4y = 8$, $x - 3y = 5$, what is the numerical value of the polynomial $x^2 + xy - 12y^2$?

- (a) 13 (b) 40 (c) $\frac{8}{5}$ (d) 3

4 If $(25)^2 - (15)^2 = 10x$, what is the value of x ?

- (a) 40 (b) 30 (c) 20 (d) 10

5 What is the greatest common factor of the polynomial $12x^2 - 8x$?

- (a) 2 (b) 4 (c) $2x$ (d) $4x$

6 If ΔXYZ is right-angled at Y , then

- (a) $(XZ)^2 = (XY)^2 - (YZ)^2$ (b) $(XY)^2 = (XZ)^2 + (YZ)^2$
 (c) $(YZ)^2 = (XZ)^2 + (XY)^2$ (d) $(XZ)^2 = (XY)^2 + (YZ)^2$

7 In $\triangle XYZ$, if $XY = YZ = XZ$, what is the measure of $\angle X$?

- (a) 30° (b) 60° (c) 90° (d) 180°

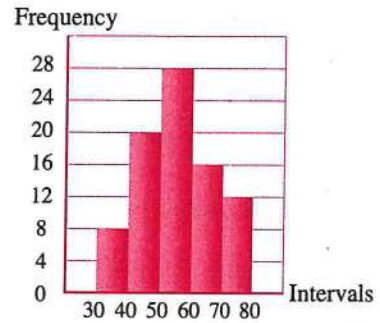
8 In 30° - 60° - 90° triangle, the ratio between the length of the hypotenuse and the length of the side opposite to the angle of measure 30° equals

- (a) 1 : 2 (b) 2 : 1 (c) 1 : 1 (d) 1 : 3

9 From the given histogram :

What is the modal interval ?

- (a) 30 – (b) 40 –
(c) 50 – (d) 70 –



Second Group :

► Answer the following questions :

1 If $x = 2\sqrt{2}$, $y = 3$, find the value of the expression $x^2 - y^2$

2 Find using the number line :

- ① $]-\infty, 6] -]4, \infty[$ ② $[-1, 4] \cup [2, 5]$

3 Factorize each of the following completely :

- ① $a b + b d + a e + d e$ ② $x^3 - 1$ ③ $4 m^4 + 1$

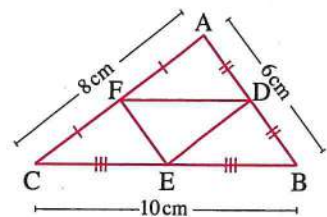
4 Determine the type of $\angle B$ in the triangle ABC where :

$AB = 9 \text{ cm}$, $BC = 10 \text{ cm}$, $AC = 12 \text{ cm}$

5 In the given figure :

D, E and F are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{AC}$ respectively.

- ① Find : The perimeter of $\triangle FED$
② Prove that : $\triangle FED$ is a right-angled triangle.



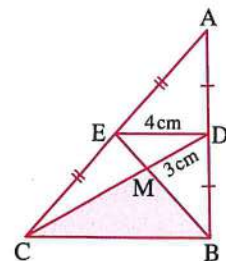
6 In the given figure :

If E and D are the midpoints of $\overline{AC}$ and $\overline{AB}$ respectively,

$\overline{CD} \cap \overline{BE} = \{M\}$, $DE = 4 \text{ cm}$,

$DM = 3 \text{ cm}$, $BE = 6 \text{ cm}$

Find : The perimeter of $\triangle BMC$



7 From the given stem-and-leaf plot :

Form the frequency table with intervals and the ascending cumulative frequency table and represent it graphically.

Stems	Leaves
1	4 5 5 7 8 9
2	5 7 8 9 9
3	1 2 2 2 4 5
4	6 7 8
5	0 1 2 3
Key	3 2 means 32

Exam 3

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 $\mathbb{R} = \dots\dots\dots$

- (a) $\mathbb{R}^+ \cap \mathbb{R}^-$ (b) $\mathbb{R}^+ \cup \mathbb{R}^-$ (c) $]-\infty, \infty[$ (d) $\mathbb{Q} \cap \mathbb{Q}$

2 What is the value of $\sqrt{5} + \sqrt{5}$?

- (a) $\sqrt{10}$ (b) $\sqrt{20}$ (c) 5 (d) 10

3 Which of the following represents the factorization of the polynomial $5x - 6 - x^2$?

- (a) $(x - 2)(x - 3)$ (b) $(x + 2)(x + 3)$
(c) $-(x + 2)(x + 3)$ (d) $-(x - 2)(x - 3)$

4 If $a^2 - b^2 = 45$, $a - b = 5$, then what is the value of $\sqrt{a + b}$?

- (a) 9 (b) 3 (c) -3 (d) ± 3

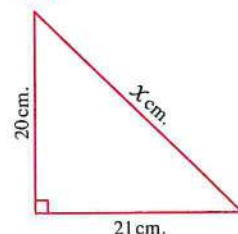
5 If $x^3 + 27 = (x + 3)(x^2 + k + 9)$, what is the value of k ?

- (a) $-6x$ (b) $-3x$ (c) $3x$ (d) $6x$

6 In the given figure :

What is the value of x ?

- (a) 41 (b) 29
(c) $\sqrt{41}$ (d) $\sqrt{29}$



7 If $\overline{AD}$ is a median in $\triangle ABC$, the length of $\overline{AD}$ is 9 cm , M is the centroid of the triangle ABC , then $DM = \dots\dots\dots$ cm

- (a) 3 (b) 4.5 (c) 6 (d) 9

8 Which of the following formulas is used to calculate the measure of an interior angle in a regular polygon ?

- (a) $(n - 2) \times 180^\circ$ (b) $\frac{(n - 2) \times 180^\circ}{2}$ (c) $\frac{(n - 2) \times 180^\circ}{n}$ (d) $\frac{(n + 2) \times 180^\circ}{n}$

- 9 If the projection of the point (35, 50) which lies on the cumulative frequency curve on the axis of intervals determines the median, what is the order of the median?

(a) 50 (b) 10 (c) 35 (d) 70

Second Group :

► Answer the following questions :

- 1 Find the solution set of each of the following in $\mathbb{R}$:

① $2x^2 - 3 = 9$ ② $x^2 - x = 0$

- 2 If $A = [-1, 3[$, $B = [2, 5[$, find using the number line :

① $A \cup B$ ② $A \cap B$ ③ $B - A$

- 3 Factorize each of the following completely :

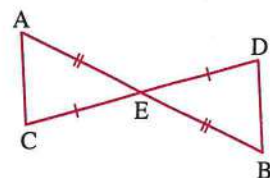
① $2x^2 + 3x + 1$ ② $m^2 - 2m + 1$ ③ $2x^3 + 16$

- 4 In the given figure :

E is the midpoint of each of $\overline{CD}$ and $\overline{AB}$

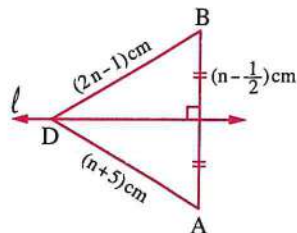
Prove that :

① $\triangle AEC \cong \triangle BED$ ② $\overline{AC} \parallel \overline{DB}$



- 5 In the given figure :

Find : $m(\angle A)$

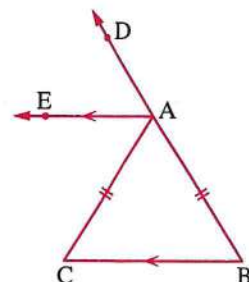


- 6 In the given figure :

$AB = AC$, $A \in \overrightarrow{BD}$, $\overrightarrow{AE} \parallel \overrightarrow{BC}$

Prove that :

$\overrightarrow{AE}$ bisects $\angle DAC$



- 7 From the data of the following frequency table :

Intervals	0 -	2 -	4 -	6 -
Frequency	1	2	2	5

Draw the ascending cumulative frequency curve, then use it to estimate the value of the median.

Exam 4

Answer the following questions :

First Group :

► **Choose the correct answer from those given :**

- 1 The set of non-negative real numbers is
(a) $]0, \infty[$ (b) $]-\infty, 0[$ (c) $[0, \infty[$ (d) $]-\infty, 0]$
- 2 What is the value of $3X^0$? where $X \neq 0$
(a) 0 (b) 1 (c) 3 (d) $3X$
- 3 $6a - 8b = \dots\dots\dots$
(a) $6(a - 2b)$ (b) $4(2a - 4b)$ (c) $2(3a - 4b)$ (d) $14(a - b)$
- 4 If $X^2 - a = (X - 4)(X + 4)$, what is the value of a ?
(a) -16 (b) 16 (c) -8 (d) 8
- 5 When completing the square for $(X^2 + 9)$, we add
(a) $\pm 3X$ (b) $\pm 6X$ (c) $\pm 9X$ (d) $\pm 12X$
- 6 If $\triangle ABC \cong \triangle XYZ$, the perimeter of $\triangle ABC = 12$ cm , $XY = 4$ cm , $YZ = 5$ cm , what is the length of $\overline{AC}$?
(a) 3 cm (b) 5 cm (c) 9 cm (d) 12 cm
- 7 What is the number of medians in an obtuse-angled triangle ?
(a) 0 (b) 1 (c) 2 (d) 3
- 8 In $\triangle ABC$, if $m(\angle A) = m(\angle B) \neq 60^\circ$, what is the number of its axes of symmetry ?
(a) 0 (b) 1 (c) 2 (d) 3
- 9 If the upper limit of an interval is 18 and its center is 15.5 , what is the lower limit of this interval ?
(a) 12 (b) 12.5 (c) 13 (d) 13.5

Second Group :

► **Answer the following questions :**

1 **Simplify each of the following to the simplest form :**

① $\sqrt{5} - \sqrt{3} + 2\sqrt{5} + \sqrt{3}$

② $\frac{X^2 \times X^{-3}}{X^{-4} \times X}$

2 The dimensions of a rectangle are $(6 + \sqrt{5})$ cm and $(6 - \sqrt{5})$ cm , calculate its area.

3 Factorize each of the following completely :

① $x^2 - 2x - xy + 2y$

② $x^3 - 25x$

③ $x^2 + 21 - 10x$

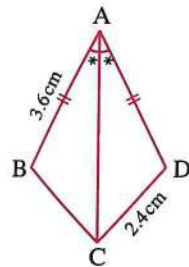
4 In the given figure :

$\overline{AB} \cong \overline{AD}$, $AB = 3.6$ cm

$CD = 2.4$ cm , $\overline{AC}$ bisects $\angle BAD$

① Prove that : $\triangle ACB \cong \triangle ACD$

② Find : The perimeter of the polygon ABCD



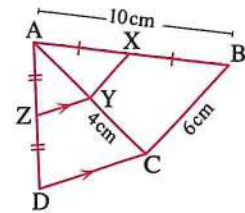
5 In the given figure :

ABCD is a quadrilateral in which X and Z are the midpoints of $\overline{AB}$ and $\overline{AD}$ respectively , $Y \in \overline{AC}$ such that $\overline{ZY} \parallel \overline{DC}$, $YC = 4$ cm

If $AB = 10$ cm , $BC = 6$ cm

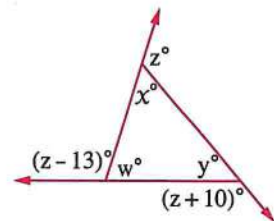
Find : ① The length of $\overline{AY}$

② The perimeter of $\triangle AXY$

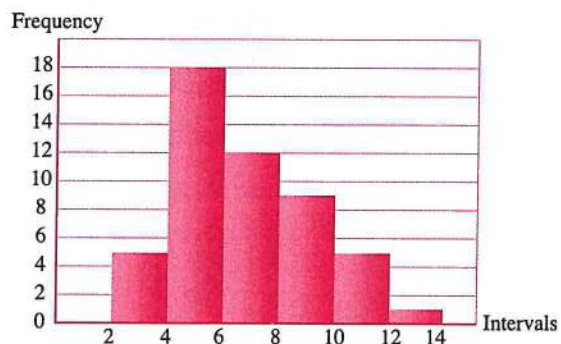


6 In the given figure :

Find the value of each of : z , x , y and w



7 If the given histogram shows masses of 50 pieces of one of the products sold online. Form the frequency table with intervals and the ascending cumulative frequency table and represent it graphically.



Exam 5

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 $5 + 7\sqrt{2} - 4 + \sqrt{2} = \dots\dots\dots$

(a) 15

(b) $1 + 7\sqrt{2}$

(c) $1 + 8\sqrt{2}$

(d) $1 + 6\sqrt{2}$

2 What is the result of $5^2 + 5^2$?

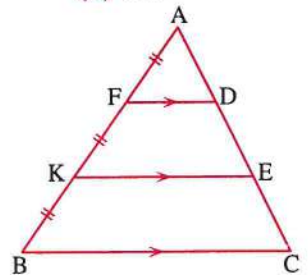
(a) 10^2

(b) 10^4

(c) 5^4

(d) 50

- 3 $49ab + 14b^2 = 7b(\dots\dots\dots)$
 (a) $7b + 2a$ (b) $7a + 2b$ (c) $42a + 7b$ (d) $14ab$
- 4 If the polynomial $(16x^2 - 40x + k^2)$ is a perfect square, what is the value of k ?
 (a) 5 (b) -5 (c) ± 5 (d) 8
- 5 $xy + 5x + 7y + 35 = (x + a)(y + b)$, what is the value of $a - b$?
 (a) 2 (b) -2 (c) 12 (d) -12
- 6 If $\triangle ABC \cong \triangle LMN$, $m(\angle C) = 90^\circ$, then $m(\angle L) + m(\angle M) = \dots\dots\dots$
 (a) 45° (b) 90° (c) 180° (d) 120°
- 7 In the given figure :
 If $AC = 12$ cm ,
 what is the length of $\overline{AE}$?
 (a) 3 cm (b) 4 cm
 (c) 6 cm (d) 8 cm
- 8 If C belongs to the axis of symmetry of $\overline{AB}$, then what is the value of $AC - BC$?
 (a) zero (b) 1 (c) 2 (d) 4
- 9 If $\sum f = 50$, $\sum (f \cdot x_m) = 800$, what is the arithmetic mean $\bar{x}$?
 (a) 16 (b) 160 (c) 750 (d) 850



Second Group :

► Answer the following questions :

1 Find in $\mathbb{R}$ the solution set of each of the following equations :

① $x^2 - 11 = 5$

② $x^2 - 15 = 2x$

2 If $a = \sqrt{3} + \sqrt{2}$, $b = \frac{1}{\sqrt{3} + \sqrt{2}}$

Find in the simplest form the value of : $(a - b)^2$

3 [a] Factorize each of the following completely :

① $l^2 + 8l - 20$

② $b^2 - 4$

[b] Use factorization to facilitate finding the value of : $(87)^2 - (13)^2$

4 In the given figure :

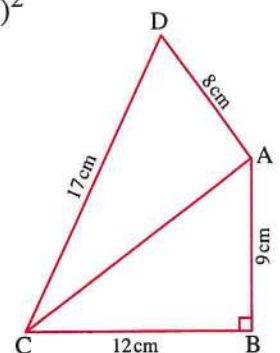
ABCD is a quadrilateral where : $m(\angle B) = 90^\circ$,

$AB = 9$ cm , $BC = 12$ cm ,

$CD = 17$ cm , $AD = 8$ cm

Prove that : $m(\angle DAC) = 90^\circ$

Then find : The area of the figure ABCD

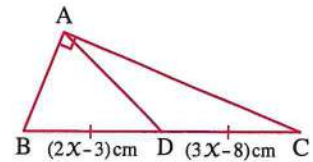


5 In the given figure :

$\overline{AD}$ is a median of $\triangle ABC$,

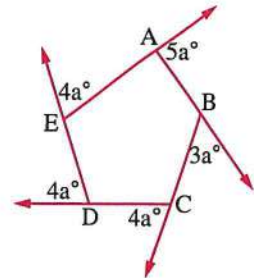
$\triangle ABC$ is right angled at A

Find : The length of $\overline{AD}$



6 In the given figure :

Find : $m(\angle BCD)$



7 The following table shows the frequency distribution of marks for 40 students in one of the tests :

Intervals	5 –	15 –		35 –	45 –	Total
Number of students	3		12	10	5	40

- ① Complete the table.
- ② Estimate the arithmetic mean.
- ③ Find the number of students whose marks are not less than 35

Exm 6

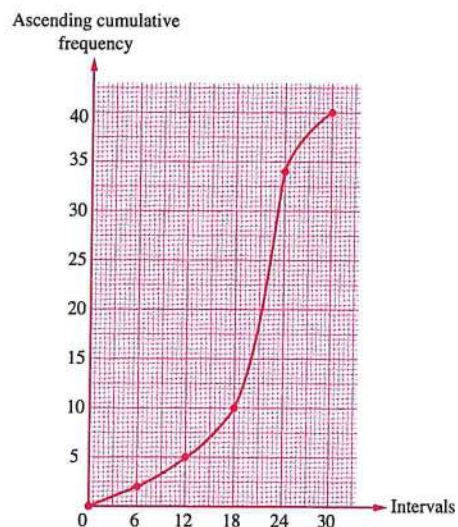
Answer the following questions :

First Group :

► Choose the correct answer from those given :

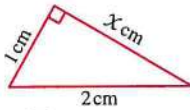
- 1 The given figure represents the ascending cumulative frequency curve of the marks of a class containing 40 students in one of the exams.
What is the number of students who got less than 12 marks ?

- (a) 5 (b) 10
(c) 20 (d) 40



- 2 Which of the following numbers is irrational ?

- (a) $0.\bar{3}$ (b) $\sqrt{\frac{9}{25}}$ (c) $\sqrt{5}$ (d) $\sqrt[3]{-125}$

- 3 $2\sqrt{7} - 3\sqrt{3} + \sqrt{7} + 2\sqrt{3} = \dots\dots\dots$
 (a) $\sqrt{7} - 5\sqrt{3}$ (b) $3\sqrt{7} + 5\sqrt{3}$ (c) $3\sqrt{7} + \sqrt{3}$ (d) $3\sqrt{7} - \sqrt{3}$
- 4 If $x^2 + 2x - 15 = 0$, which of the following is true?
 (a) $x = 3, x = 5$ (b) $x = 3, x = -5$
 (c) $x = -3, x = 5$ (d) $x = -3, x = -5$
- 5 $x^2 - ax + bx - ab = \dots\dots\dots$
 (a) $(x - a)(x - b)$ (b) $(x - a)(x + b)$
 (c) $(x + a)(x - b)$ (d) $(x + a)(x + b)$
- 6 If the polynomial $(kx^2 - 12x + 9)$ is a perfect square, what is the value of k ?
 (a) 4 (b) ± 4 (c) 2 (d) ± 2
- 7 In the given figure :
 What is the value of x ?
- 
- (a) 1 (b) 3 (c) $\sqrt{5}$ (d) $\sqrt{3}$
- 8 The centroid of the triangle divides each median in the ratio from the vertex.
 (a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 2 : 3
- 9 If $\triangle ABC \cong \triangle XYZ$, $m(\angle B) + m(\angle C) = 100^\circ$, then $m(\angle X) = \dots\dots\dots$
 (a) 40° (b) 50° (c) 80° (d) 100°

Second Group :

► Answer the following questions :

- 1 [a] Find in the simplest form : $\sqrt[3]{54} + 4\sqrt[3]{\frac{1}{4}} - \sqrt[3]{2}$
 [b] If $A =]-1, 3]$, $B = [0, 5[$, find each of the following :
 ① $A \cap B$ ② $B - A$
- 2 [a] Simplify to the simplest form : $\frac{(\sqrt{6})^{n+2} \times (\sqrt{3})^n}{4 \times (\sqrt{2})^{n-2}}$
 [b] Find the solution set in $\mathbb{R}$ of each of the following :
 ① $2x^3 + 13 = 67$ ② $4x^2 + 1 = 4x$
- 3 Factorize each of the following completely :
 ① $-x^2 + 3x + 40$ ② $4m^4 + 1$
 ③ $a(b + 5) + 2(b + 5)$

- 4 Using the following frequency distribution table , find the mean value :

Intervals	5 –	15 –	25 –	35 –	45 –	Total
Frequency	4	5	6	3	2	20

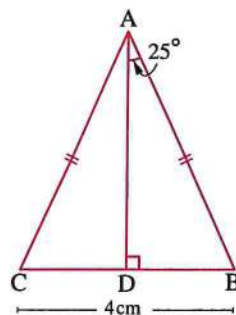
- 5 In the given figure :

In $\triangle ABC$, $AB = AC$, $\overline{AD} \perp \overline{BC}$,

$m(\angle BAD) = 25^\circ$, $BC = 4$ cm

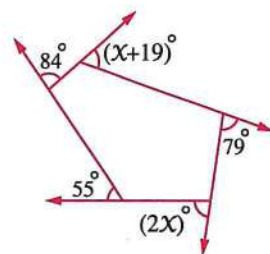
Find : ① $m(\angle DAC)$

② The length of $\overline{DC}$



- 6 From the given figure :

Find : The value of x

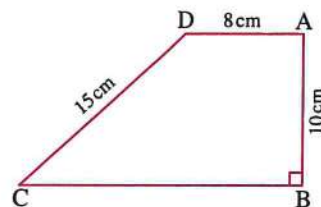


- 7 In the given figure :

ABCD is a trapezoid right-angled at B

$AD = 8$ cm , $DC = 15$ cm , $AB = 10$ cm

Find : The area of the trapezoid ABCD



Exam 7

Answer the following questions :

First Group :

- Choose the correct answer from those given :

- 1 What is the result of $[1, 3] - \{1, 3\}$?

(a) $]1, 3[$ (b) $[1, 3[$ (c) $] - 3, - 1[$ (d) $] - 1, 3[$

- 2 $(2^3\sqrt{2})^3 = \dots\dots\dots$

(a) 4 (b) 8 (c) 16 (d) 40

- 3 If the polynomial $(x^2 + kx + 36)$ is a perfect square , what is the value of k ?

(a) ± 6 (b) ± 8 (c) ± 12 (d) ± 18

- 4 If $x + y = 6$, $x^2 - y^2 = 12$, what is the value of $x - y$?

(a) 4 (b) 6 (c) 2 (d) - 2

- 5 If $(X + 1)$ is one of the factors of the trinomial $(5X^2 - 2X - 7)$, what is the other factor ?
 (a) $7X - 5$ (b) $7X + 5$ (c) $5X + 7$ (d) $5X - 7$
- 6 What is the center of the first interval in the intervals : $5 -$, $15 -$, $25 -$, $35 -$?
 (a) 5 (b) 10 (c) 15 (d) 20
- 7 The number of medians of the right-angled triangle is
 (a) 0 (b) 1 (c) 2 (d) 3
- 8 If ΔABC has one axis of symmetry , $m(\angle ABC) = 140^\circ$, what is $m(\angle A)$?
 (a) 30° (b) 20° (c) 40° (d) 60°
- 9 What is the measure of the interior angle of a regular hexagon ?
 (a) 60° (b) 108° (c) 120° (d) 135°

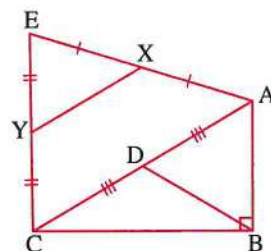
Second Group :

► Answer the following questions :

1 In the given figure :

X , Y and D are the midpoints of $\overline{EA}$, $\overline{EC}$ and $\overline{AC}$ respectively ,
 $m(\angle ABC) = 90^\circ$

Prove that : $BD = YX$



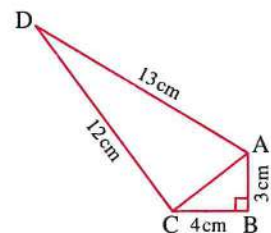
2 In the given figure :

$ABCD$ is a quadrilateral where $m(\angle B) = 90^\circ$,

$AB = 3$ cm , $BC = 4$ cm , $AD = 13$ cm ,

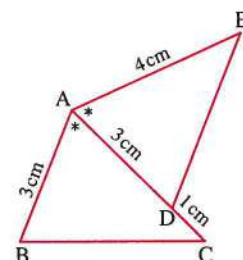
$CD = 12$ cm

Prove that : $m(\angle ACD) = 90^\circ$



3 In the given figure :

Prove that : $\Delta ABC \cong \Delta ADE$



4 Factorize each of the following completely :

① $X^2 + 7X + 12$

② $3X^3 + 24$

③ $7X - 28 + aX - 4a$

5 If $X = \sqrt{5} - \sqrt{3}$, $y = \frac{2}{\sqrt{5} - \sqrt{3}}$, what is the value of : $X^2 + y^2$?

6 Find the solution set of each of the following two equations in $\mathbb{R}$:

① $6x^2 - 3 = 4x^2 + 7$

② $x^2 - 6x = -8$

7 Using the following frequency distribution table :

Intervals	5 –	15 –	25 –	35 –	45 –	Total
Frequency	7	9	12	k	4	40

① Find the value of k

② Estimate the median.

Exam 8

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 What is the estimate of the number $\sqrt[3]{36}$ to the nearest integer ?

(a) 3

(b) 4

(c) 5

(d) 6

2 If $x^2 - a = (x - 5)(x + 5)$, what is the value of a ?

(a) -25

(b) 25

(c) -10

(d) 10

3 What is the convex polygon that has no diagonals ?

(a) The hexagon

(b) The pentagon

(c) The quadrilateral

(d) The triangle

4 In the given figure :

$AD = DB = AB = BC$, $m(\angle ABC) = 90^\circ$

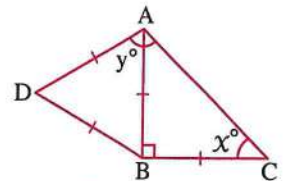
What is the value of $x + y$?

(a) 45

(b) 60

(c) 120°

(d) 150



5 If the polynomial $(16y^2 + ky + 1)$ is a perfect square, what is the value of k ?

(a) -8

(b) 8

(c) ± 8

(d) ± 4

6 If $\sqrt[3]{40} = a\sqrt[3]{5}$, what is the value of a ?

(a) 8

(b) 2

(c) 5

(d) 40

7 In the given figure :

If $\overline{AB} \perp \overline{CB}$, $AB = 12$ cm,

$BC = 5$ cm, $AD = 7$ cm, $DC = x$ cm,

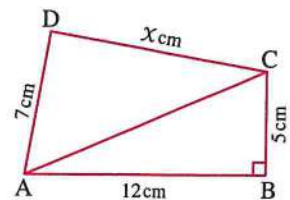
then $x \in \dots\dots\dots$

(a) $[6, 13[$

(b) $]6, 20[$

(c) $[13, 20]$

(d) $[6, 20]$



- 8 If the lower limit of an interval is 10 and the upper limit is X and its center is 15, what is the value of X ?

(a) 5 (b) 12.5 (c) 20 (d) 25

- 9 $aX + ay - bX - by = \dots\dots\dots$

(a) $(X - y)(a - b)$ (b) $(X + y)(a + b)$
(c) $(X - y)(a + b)$ (d) $(X + y)(a - b)$

Second Group :

- Answer the following questions :

- 1 Find the solution set of each of the following equations in $\mathbb{R}$:

① $X^2 - 9X + 18 = 0$

② $9X^2 + 5 = 24X$

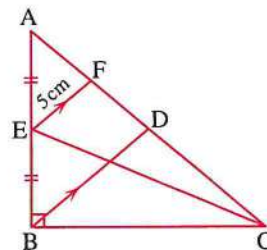
- 2 In the given figure :

If ABC is a right-angled triangle at B in which

$\overline{BD}$ and $\overline{CE}$ are two medians ,

$\overline{EF} \parallel \overline{BD}$, $EF = 5$ cm

Find with proof : The length of $\overline{AC}$



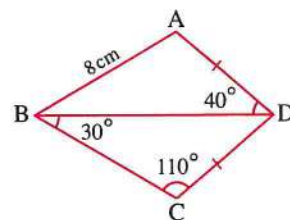
- 3 In the given figure :

$AD = CD$, $m(\angle ADB) = 40^\circ$, $m(\angle C) = 110^\circ$

$m(\angle DBC) = 30^\circ$, $AB = 8$ cm

Find with proof : ① The length of $\overline{BC}$

② $m(\angle ABC)$



- 4 Simplify to the simplest form : $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

- 5 If $X = [-2, 1[$, $Y = [1, 4[$, find using the number line each of the following :

① $X \cap Y$

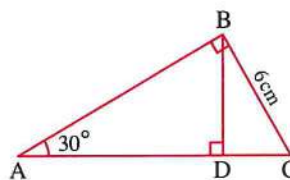
② $Y - X$

- 6 In the given figure :

ABC is a right-angled triangle at B , $m(\angle A) = 30^\circ$,

$BC = 6$ cm , $\overline{BD} \perp \overline{AC}$

Find : The length of $\overline{AD}$



- 7 The following table shows the frequency distribution of the marks of 100 students in one of the tests :

Intervals	10 –	20 –	30 –	40 –	50 –	Total
Frequency	16	24	30	20	10	100

Estimate the value of the median.

Exam 9

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 If $x + y = 2$, $x^2 - xy + y^2 = 8$, what is the value of $x^3 + y^3$?

- (a) 16 (b) 10 (c) 6 (d) 4

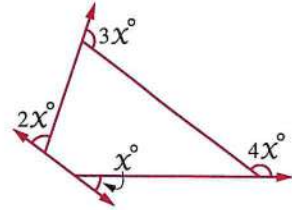
2 The set of non-positive real numbers is

- (a) $]0, \infty[$ (b) $]-\infty, 0[$ (c) $[0, \infty[$ (d) $]-\infty, 0]$

3 In the given figure :

What is the value of x ?

- (a) 360 (b) 40
(c) 36 (d) 18



4 If $3^x = 2$, what is the value of 3^{x-1} ?

- (a) 1 (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) 6

5 If $\angle A$ complements $\angle B$ in the triangle ABC , then $(AC)^2 + (BC)^2 \dots\dots\dots (AB)^2$

- (a) = (b) < (c) > (d) $\neq$

6 If $3x - 3y = 27$, what is the value of $y - x$?

- (a) 24 (b) 9 (c) -9 (d) 3

7 If the projection of the point (25 , 40) which lies on the ascending cumulative frequency curve on the horizontal axis determines the median , what is the value of the median ?

- (a) 25 (b) 40 (c) 80 (d) 50

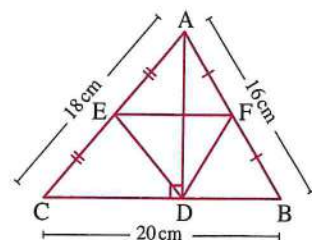
8 If the polynomial $(kx^2 - 14x + 49)$ is a perfect square , what is the value of k ?

- (a) 49 (b) ± 7 (c) -1 (d) 1

9 In the given figure :

The perimeter of $\triangle FDE = \dots\dots\dots$ cm

- (a) 37 (b) 54
(c) 18 (d) 27



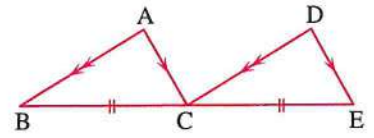
Second Group :

► Answer the following questions :

1 In the given figure :

$$\overline{AC} \parallel \overline{DE}, \overline{AB} \parallel \overline{DC}, \overline{BC} \cong \overline{CE}$$

Prove that : $\triangle ABC \cong \triangle DCE$



2 Factorize each of the following completely :

① $6x^2 + 7x + 2$

② $(a + b)^2 - 4$

③ $x^4 + 2x^3 - 9x^2 - 18x$

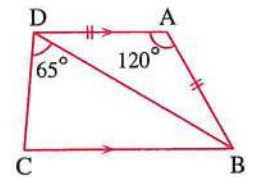
3 In the given figure :

$$AB = AD, \overline{DA} \parallel \overline{CB},$$

$$m(\angle BDC) = 65^\circ, m(\angle A) = 120^\circ$$

Find : ① $m(\angle ADB)$

② $m(\angle C)$



4 If $a = \sqrt[3]{5} + \sqrt[3]{2}$, $b = \sqrt[3]{5} - \sqrt[3]{2}$, find in the simplest form each of the following :

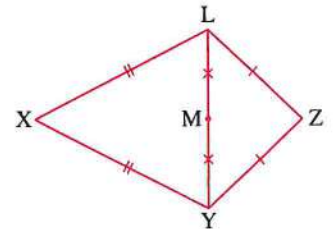
① $(a + b)^3$

② $a \times b$

5 In the given figure :

$$XL = XY, ZL = ZY, ML = MY$$

Prove that : X, M and Z are collinear.



6 If the total area of a cube is 240 cm^2 , then find the length of its edge to the nearest centimeter.

7 The following table shows the frequency distribution of marks of 40 students in one of the tests :

Intervals	5 –	15 –	25 –	35 –	45 –	Total
Frequency	3	k	12	10	5	40

Find the value of k, then estimate the arithmetic mean.

Exam 10

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 $\{3, 4, 5\} -]3, 5[= \dots\dots\dots$

- (a) $\emptyset$ (b) $\{3, 5\}$ (c) $\{4\}$ (d) $[3, 5]$

2 If $(2x + 3y)$ is one of the factors of the trinomial $(6x^2 + 13xy + 6y^2)$, what is the other factor ?

- (a) $(6x + 6y)$ (b) $(2x + 3y)$ (c) $(3x + 2y)$ (d) $(x + 3y)$

3 If $\sum f = 30$, $\sum (f \cdot x_m) = 960$, what is the arithmetic mean $\bar{x}$?

- (a) 32 (b) 320 (c) 930 (d) 990

4 In the given figure :

If G is the centroid of $\triangle ABC$,

$\triangle ABC$ is right-angled at A,

then the length of $\overline{AG} = \dots\dots\dots$ cm

- (a) 15 (b) 7.5 (c) 5 (d) 2.5

5 If $a^2 - b^2 = 16$, $a - b = 4$, what is the value of $\sqrt{a+b}$?

- (a) 2 (b) ± 4 (c) 8 (d) 16

6 In the given figure :

$\triangle ABC$ is an equilateral triangle, $\angle C$ and $\angle B$

are bisected by two bisectors that meet at D,

then $m(\angle BDC) = \dots\dots\dots$

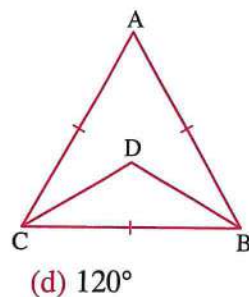
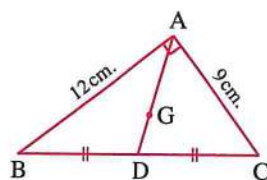
- (a) 60° (b) 90° (c) 108°

7 If $x = \frac{\sqrt[3]{9}}{\sqrt[3]{3}}$, what is the value of x^{-1} ?

- (a) $\frac{\sqrt[3]{3}}{3}$ (b) $\frac{\sqrt[3]{9}}{\sqrt[3]{2}}$ (c) $\sqrt[3]{3}$ (d) 2

8 If the polynomial $(9x^2 + 30x + k^2)$ is a perfect square, what is the value of k ?

- (a) -5 (b) 5 (c) ± 25 (d) ± 5



9 In the given figure :

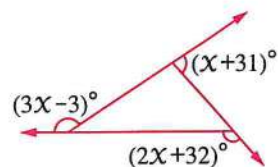
What is the value of x ?

(a) 50

(b) 20

(c) 5

(d) 2



Second Group :

► Answer the following questions :

1 A rectangular prism with dimensions $2\sqrt{2}$ cm , 7 cm , $5\sqrt{2}$ cm. Calculate its total area and volume.

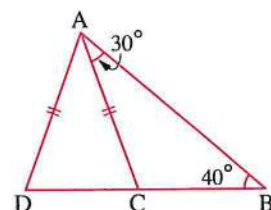
2 In the given figure :

$AC = AD$, $m(\angle B) = 40^\circ$, $m(\angle BAC) = 30^\circ$

Find by proof :

① $m(\angle D)$

② $m(\angle CAD)$



3 Use factorizing to facilitate the calculation of each of the following :

① $(999)^2 + 2 \times 999 + 1$

② $(1.6)^2 - (1.4)^2$

③ $123 \times 14 + 123 \times 37 - 123$

4 Determine the type of the triangle based on its angles if the lengths of its sides are 6 cm , 5 cm , 7 cm.

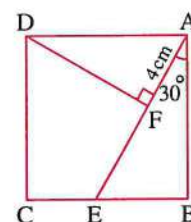
5 In the given figure :

ABCD is a square , $AF = 4$ cm ,

$\overline{DF} \perp \overline{AE}$, $m(\angle BAE) = 30^\circ$

Find : ① The length of $\overline{DF}$

② The area of the square ABCD



6 Simplify to the simplest form : $\frac{7}{3} \sqrt{18} + \sqrt[3]{54} - 7\sqrt{2} + \sqrt[3]{16}$

7 The following table shows the frequency distribution of wages in pounds for some workers in a factory :

Wage Intervals	500 –	600 –	700 –	800 –	900 –	Total
Number of Workers	8	k	18	7	5	50

Find the value of k , then estimate the mode.

Exam 11

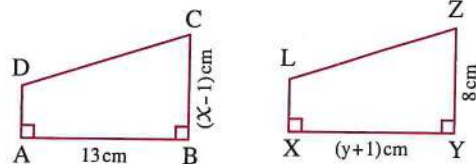
Answer the following questions :

First Group :

► Choose the correct answer from those given :

- 1 What is the half of the number 2^{14} ?
 (a) 2^{12} (b) 2^{13} (c) 4^8 (d) 4^{12}
- 2 If $x \in [-3, 4]$, then $x^2 \in \dots\dots\dots$
 (a) $[9, 16]$ (b) $[0, 9]$ (c) $[0, 16]$ (d) $[-9, 0]$
- 3 If $x + 2y = 7$, what is the value of $2x + 4y$?
 (a) 14 (b) 18 (c) 28 (d) 56
- 4 If $a^2 + 2ab + b^2 = 36$, what is the value of $a + b$?
 (a) 6 (b) -6 (c) ± 6 (d) 18
- 5 If $x + b = 3$, $x^2 + a = 4$, what is the numerical value of the polynomial $x^3 + bx^2 + ax + ab$?
 (a) 1 (b) 7 (c) 12 (d) 36
- 6 In the given figure :

If the polygon XYZL is the image of the polygon ABCD by a translation ,
 what is the value of $x + y$?



- (a) 9 (b) 12 (c) 21 (d) 22
- 7 If the lengths of two sides in an isosceles triangle are 3 cm and 4 cm , then its largest angle is
 (a) acute. (b) right. (c) obtuse. (d) straight.
- 8 If the point M is the centroid of the triangle ABC , $\overline{BD}$ is a median ,
 then $BD : MD = \dots\dots\dots$
 (a) 2 : 3 (b) 1 : 3 (c) 3 : 2 (d) 3 : 1
- 9 If the upper limit of an interval is 18 and its center is 15, what is the lower limit of this interval ?
 (a) 12 (b) 12.5 (c) 13 (d) 13.5

Second Group :

► Answer the following questions :

1 If $a = \sqrt{3} + \sqrt{2}$, $b = \frac{1}{\sqrt{3} + \sqrt{2}}$,

find the value of the expression in the simplest form : $\frac{(a-b)^2}{ab}$

2 Simplify to its simplest form : $\frac{(10)^{2n} \times 0.001}{(10)^{-n+1} \times 100}$, then find the value of the result when $n = 2$

3 [a] Use factorizing to facilitate the calculation of the value of each of the following :

① $(8.27)^2 - (1.73)^2$

② $(101)^2 - 2 \times 101 + 1$

[b] Factorize each of the following completely :

① $(x-y)^2 + 4xy$

② $x^4 + 8x$

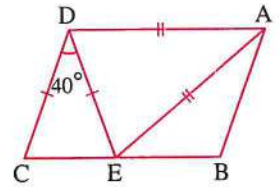
4 In the given figure :

ABCD is a parallelogram, $E \in \overline{BC}$

where $AE = AD$, $DE = DC$, $m(\angle CDE) = 40^\circ$

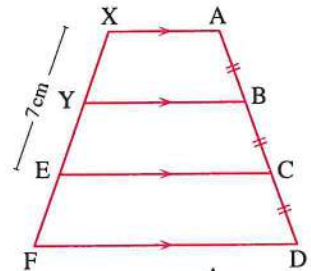
Find : ① $m(\angle AED)$

② $m(\angle BAE)$



5 In the given figure :

Find with proof : The length of $\overline{XF}$

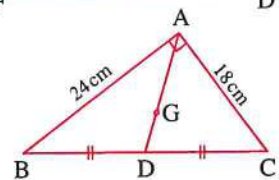


6 In the given figure :

If G is the centroid of the triangle ABC,

$\triangle ABC$ is right-angled at A

Find : The length of $\overline{AG}$



7 The following frequency table shows the frequency distribution of the number of vacation days for 50 workers :

Intervals	2 -	6 -	10 -	14 -	18 -	22 -	26 -
Frequency	4	5	8	$k - 2$	7	5	1

① Find the value of k

② Form the ascending cumulative frequency table and represent it graphically.

③ What is the percentage of workers whose vacations are less than 10 days ?

Exam 12

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 $x^{m-1} \times \dots = 1, x \neq 0$

- (a) x^{m-1} (b) x^{-m-1} (c) x^{m+1} (d) x^{-m+1}

2 What is the multiplicative inverse of the number $\sqrt{5}$ in its simplest form ?

- (a) -5 (b) $\frac{-1}{5}$ (c) $\frac{5}{\sqrt{5}}$ (d) $\frac{\sqrt{5}}{5}$

3 When completing the square for $(x^2 + 36)$, we add

- (a) $\pm 3x$ (b) $\pm 6x$ (c) $\pm 9x$ (d) $\pm 12x$

4 $x^2y - xy^2 = \dots$

- (a) $xy(x-y)$ (b) $x^2y(1-y)$ (c) $xy^2(x-1)$ (d) $xy(y-x)$

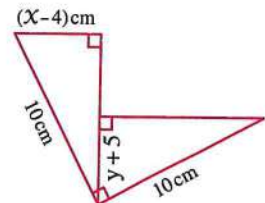
5 If $x^2 - y^2 = 20$, $x + y = 10$, what is the value of $y - x$?

- (a) 10 (b) 2 (c) -2 (d) -10

6 From the given figure :

What is the value of $x - y$?

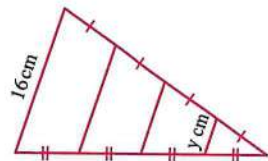
- (a) 9 (b) 6
(c) 5 (d) 1



7 From the given figure :

What is the value of y ?

- (a) 14 (b) 18
(c) 12 (d) 16

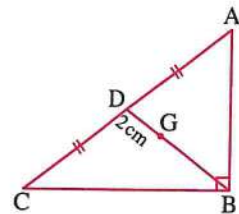


8 In the given figure :

If G is the centroid of the triangle ABC ,

$\triangle ABC$ is right angled at B , $GD = 2$ cm, what is the length of $\overline{AC}$?

- (a) 8 cm (b) 12 cm
(c) 18 cm (d) 24 cm



9 If the lower limit of an interval is 5 and its center is 15, then the length of the interval is

- (a) 5 (b) 10 (c) 20 (d) 25

Second Group :

► Answer the following questions :

1 Find using the number line :

① $[2, 7] - [3, 8[$ ② $]3, \infty[\cap]-\infty, 7[$ ③ $] -\infty, 3[$

2 Simplify to the simplest form : $\frac{(\sqrt{5})^n \times (\sqrt{3})^{2-n}}{3 \times (\sqrt{15})^{-n}}$, then find the numerical value of the result when $n = -2$

3 Factorize each of the following completely :

① $x^2 + x - 42$

② $25 - 9x^2$

③ $14a(x+y) - 21b(x+y)$

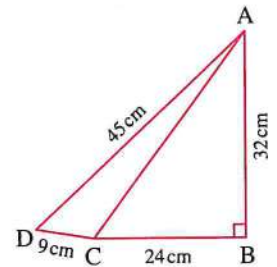
4 In the given figure :

ABCD is a quadrilateral where $m(\angle B) = 90^\circ$,

$AB = 32 \text{ cm}$, $BC = 24 \text{ cm}$,

$CD = 9 \text{ cm}$, $AD = 45 \text{ cm}$

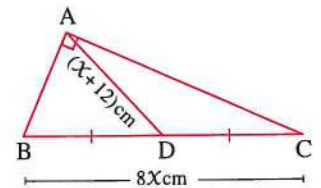
Prove that : $\triangle ACD$ is an obtuse angled triangle.



5 In the given figure :

$\triangle ABC$ is right-angled at A, $\overline{AD}$ is its median.

Find : The length of $\overline{AD}$



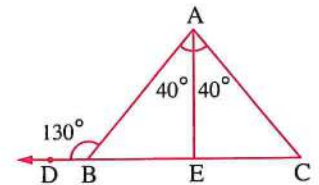
6 In the given figure :

$D \in \overline{CB}$, $m(\angle ABD) = 130^\circ$,

$m(\angle BAE) = m(\angle CAE) = 40^\circ$

Prove that : ① $\overline{AE} \perp \overline{BC}$

② E is the midpoint of $\overline{BC}$



7 The given table shows the frequency distribution of marks of 60 students in the mathematics test :

Find the value of k, then draw the ascending cumulative frequency curve, and estimate the median.

Marks	Frequency
5 –	2
10 –	5
15 –	14
20 –	20
25 –	k
30 –	5
35 –	1
Total	60

Answers of Final Assessment from the School Book

First Group :

- 1 (d) 2 (a) 3 (b) 4 (a)
5 (c) 6 (c) 7 (d) 8 (a)
9 (c)

Second Group :

- 1
1 $[-2, 1]$ 2 $]-4, 5[$ 3 $]1, 5[$
2 $(\sqrt{3})^{n+4}, 9$

3 1 cm

4 90

5

1 $(2x+5)(2x-5)$

2 $(b-2)(b^2+2b+4)$

3 $2(2x-3)(x+5)$

6 $(9-x)(9+x)$

7 $k=4$, $\bar{x}=21$

Answers of Final Exam Models

1

Model answer

First Group :

- 1** (a) **2** (b) **3** (c)
4 (b) **5** (b) **6** (a)
7 (c) **8** (a) **9** (c)

Second Group :

- 1** **1** $7\sqrt{2}$ **2** 7
2 **1** $\frac{7}{9}$ **2** 63
3 (a) 1,100
 (b) **1** $(3a+2)(4a-3)$
 2 $(x+1)(x^2-x+1)$
4 $x=2, y=7$ **5** 36 cm
6 $m(\angle A) = 34^\circ, m(\angle B) = m(\angle C) = 73^\circ$
7 mode ≈ 249 minutes.

2

Model answer

First Group :

- 1** (c) **2** (a) **3** (b)
4 (a) **5** (d) **6** (d)
7 (b) **8** (b) **9** (c)

Second Group :

- 1** -1
2 **1** $]-\infty, 4]$ **2** $[-1, 5]$
3 **1** $(a+d)(b+e)$
 2 $(x-1)(x^2+x+1)$
 3 $(2m^2+1+2m)(2m^2+1-2m)$
4 Acute angle.
5 **1** 12 cm **2** Prove it yourself.
6 18 cm
7 Form it yourself, represent it yourself.

3

Model answer

First Group :

- 1** (c) **2** (b) **3** (d)
4 (b) **5** (b) **6** (b)
7 (a) **8** (c) **9** (a)

Second Group :

- 1** **1** $\{-\sqrt{6}, \sqrt{6}\}$ **2** $\{0, 1\}$
2 **1** $[-1, 5[$ **2** $[2, 3[$
 3 $[3, 5[$
3 **1** $(2x+1)(x+1)$
 2 $(m-1)^2$
 3 $2(x+2)(x^2-2x+4)$
4 Prove it yourself. **5** 60°
6 Prove it yourself. **7** 6

4

Model answer

First Group :

- 1** (c) **2** (c) **3** (c)
4 (b) **5** (b) **6** (a)
7 (d) **8** (b) **9** (c)

Second Group :

- 1** **1** $3\sqrt{5}$ **2** x^2
2 31 cm^2
3 **1** $(x-y)(x-2)$
 2 $x(x+5)(x-5)$
 3 $(x-3)(x-7)$
4 **1** Prove it yourself. **2** 12 cm
5 **1** 4 cm **2** 12 cm
6 $x=59, y=49, z=121, w=72$
7 Form it yourself, represent it yourself.

5 Model answer**First Group :**

- 1 (c) 2 (d) 3 (b)
 4 (c) 5 (a) 6 (b)
 7 (d) 8 (a) 9 (a)

Second Group :

- 1 ① The solution set = $\{-4, 4\}$
 ② The solution set = $\{-3, 5\}$

2 8

- 3 (a) ① $(l-2)(l+10)$
 ② $(b-2)(b+2)$
 (b) 7,400

4 Prove it yourself , 114 cm²

5 7 cm

6 108°

7 ① 25 - , 10

② 31

③ 15

6 Model answer**First Group :**

- 1 (a) 2 (c) 3 (d)
 4 (b) 5 (b) 6 (a)
 7 (d) 8 (b) 9 (c)

Second Group :1 (a) $4\sqrt[3]{2}$ (b) ① $[0, 3]$ ② $]3, 5[$ 2 (a) $(\sqrt{3})^{2n+2}$ (b) ① The solution set = $\{3\}$ ② The solution set = $\{\frac{1}{2}\}$ 3 ① $-(X-8)(X+5)$ ② $(2m^2 + 2m + 1)(2m^2 - 2m + 1)$ ③ $(b+5)(a+2)$

4 27

5 ① 25°

② 2 cm

6 41

7 $(80 + 25\sqrt{5}) \text{ cm}^2$ **7 Model answer****First Group :**

- 1 (a) 2 (c) 3 (c)
 4 (c) 5 (d) 6 (b)
 7 (d) 8 (b) 9 (c)

Second Group :

1 Prove it yourself. 2 Prove it yourself.

3 Prove it yourself.

4 ① $(X+3)(X+4)$ ② $3(X+2)(X^2 - 2X + 4)$ ③ $(X-4)(7+a)$

5 16

6 ① The solution set = $\{\sqrt{5}, -\sqrt{5}\}$ ② The solution set = $\{2, 4\}$

7 ① 8

② $28\frac{1}{3}$ **8 Model answer****First Group :**

- 1 (a) 2 (b) 3 (d)
 4 (d) 5 (c) 6 (b)
 7 (b) 8 (c) 9 (d)

Second Group :1 ① $\{3, 6\}$ ② $\{\frac{4-\sqrt{11}}{3}, \frac{4+\sqrt{11}}{3}\}$

2 20 cm

3 ① 8 cm

② 60°

4 1

5 ① $\emptyset$ ② $[1, 4[$

6 9 cm

7 $33\frac{1}{3}$

9**Model answer****First Group :**

- 1 (a) 2 (d) 3 (c)
 4 (b) 5 (a) 6 (c)
 7 (a) 8 (d) 9 (d)

Second Group :

- 1 Prove it yourself.
 2 ① $(2x+1)(3x+2)$
 ② $(a+b+2)(a+b-2)$
 ③ $x(x-3)(x+3)(x+2)$
 3 ① 30° ② 85°
 4 ① 40 ② $\sqrt[3]{25-\sqrt[3]{4}}$

5 Prove it yourself.

6 6 cm

7 $k = 10$, $\bar{X} = 31$ **10****Model answer****First Group :**

- 1 (b) 2 (c) 3 (a)
 4 (c) 5 (a) 6 (d)
 7 (a) 8 (d) 9 (a)

Second Group :

1 The total area = $(40 + 98\sqrt{2}) \text{ cm}^2$
 , the volume = 140 cm^3

2 ① 70° ② 40°

3 ① 1,000,000 ② 0.6
 ③ 6,150

4 Acute-angled triangle

5 ① $4\sqrt{3} \text{ cm}$ ② 64 cm^2 6 $5\sqrt[3]{2}$ 7 $k = 12$, the mode = 735 approximately.**11****Model answer****First Group :**

- 1 (b) 2 (c) 3 (a)
 4 (c) 5 (c) 6 (c)
 7 (a) 8 (d) 9 (a)

Second Group :

- 1 8
 2 $(10)^{3n-6}$, 1
 3 (a) ① 65.4 ② 10,000
 (b) ① $(x+y)^2$
 ② $x(x+2)(x^2-2x+4)$
 4 ① 70° ② 30°
 5 10.5 cm
 6 10 cm
 7 ① 22 ② Form it yourself.
 ③ 18 %

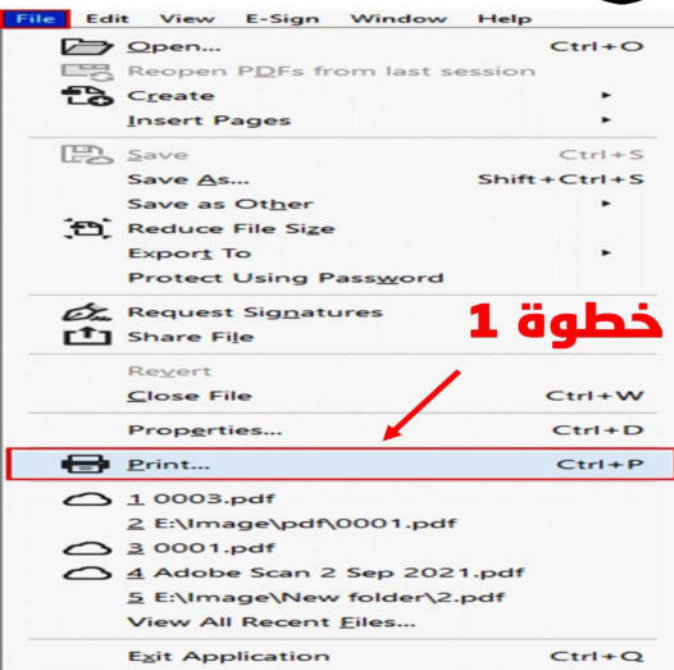
12**Model answer****First Group :**

- 1 (d) 2 (d) 3 (d)
 4 (a) 5 (c) 6 (a)
 7 (a) 8 (b) 9 (c)

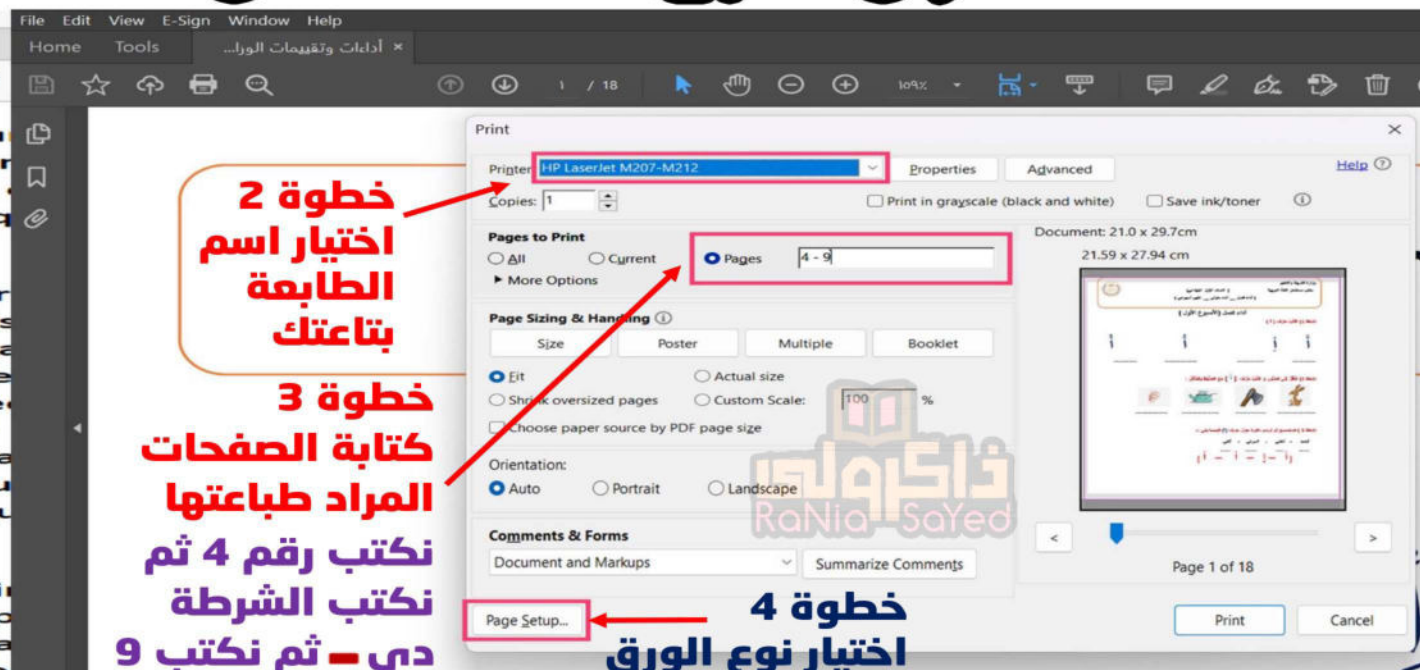
Second Group :

- 1 ① $[2, 3[$ ② $]3, 7[$
 ③ $[3, \infty[$
 2 $(\sqrt{5})^{2n} \cdot \frac{1}{25}$
 3 ① $(x+7)(x-6)$
 ② $(5-3x)(5+3x)$
 ③ $7(x+y)(2a-3b)$
 4 Prove it yourself. 5 16 cm
 6 Prove it yourself.
 7 $k = 13$, the median = 22.5 approximately.

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



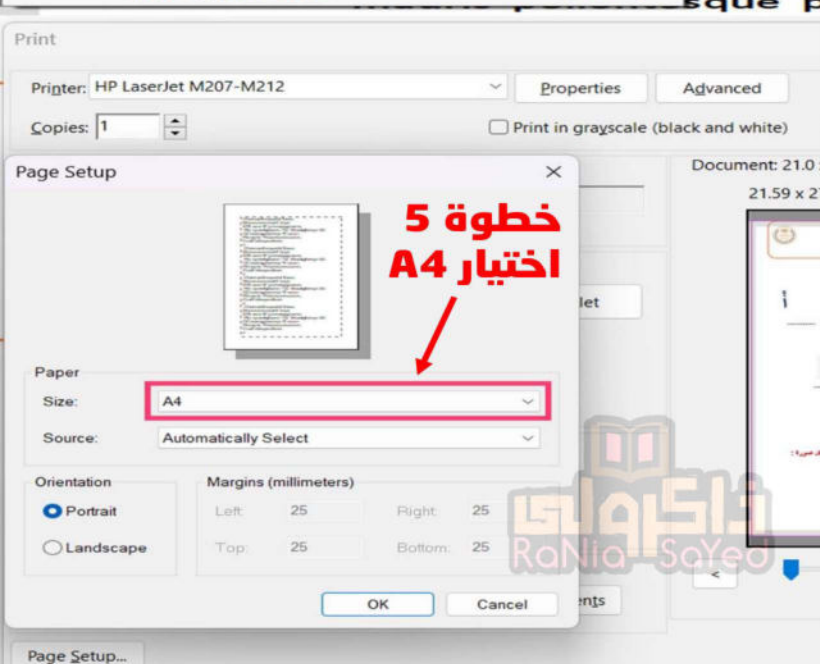
خطوة 1



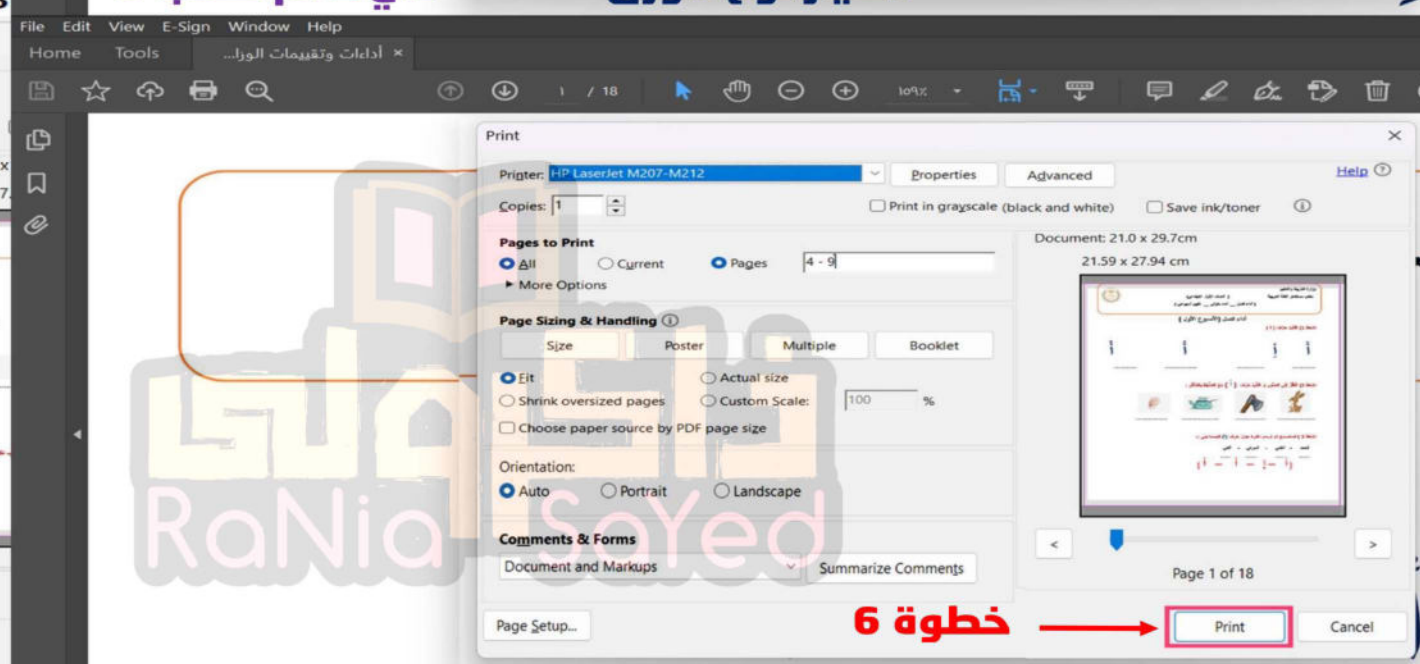
خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6

حمل الآن

مجاناً وحصرياً

امتحانات رقم (2)

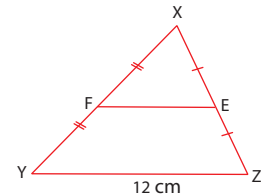
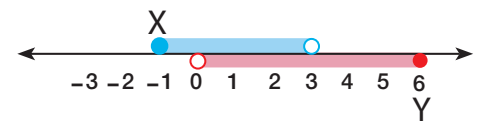
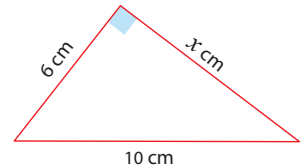
الترم الاول



1- Choose the correct answer:

9

- a What is the number of sides of a polygon whose sum of measures of its interior angles is 1440° ?
(10 , 11 , 12 , 13)
- b $\mathbb{R} = \dots\dots\dots$
($\mathbb{R}^+ \cap \mathbb{R}^-$, $\mathbb{R}^+ \cup \mathbb{R}^-$, $]-\infty, \infty[$, $\mathbb{Q} \cap \mathbb{Q}'$)
- c In the opposite figure, the value of x is =
(4 , 7 , 8 , 6)
- d Using the number line: $X - Y = \dots\dots\dots$
($] -1, 6[$, $[-1, 6]$, $[-1, 0]$, $]0, 3[$)
- e In the opposite figure: The length of $\overline{FE}$ is
(12 cm , 3 cm , 9 cm , 6 cm)
- f When completing the square for $(x^2 + 16)$, we add
($\pm 2x$, $\pm 4x$, $\pm 8x$, $\pm 12x$)
- g Each of the following is a measure of central tendency except
(the mode , the median , the mean , the range)
- h If $\Sigma f \cdot m = 320$, $\Sigma f = 40$, then the arithmetic mean =
(8 , 80 , 40 , 4)
- i The multiplicative inverse of the number $2 - \sqrt{3}$ is
($2 + \sqrt{3}$, $2 - \sqrt{3}$, $-\sqrt{3} + 2$, $2\sqrt{3}$)



2- Answer each of the following:

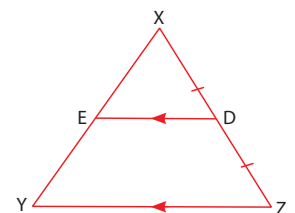
21

- a In the given figure:
Find with proof the ratio of the length of $\overline{XE}$ to the length of $\overline{EY}$

.....

.....

.....



- b** Find the number of sides of a convex polygon that has 9 diagonals.

.....

.....

.....

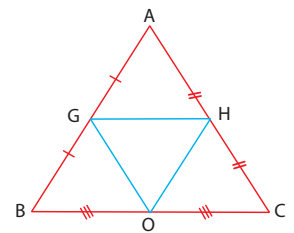
- c** ABC is a triangle, H, G and O are midpoints of $\overline{AC}$, $\overline{AB}$, and $\overline{BC}$ respectively, If the perimeter of $\triangle ABC = 36$ cm,

find the perimeter of $\triangle HGO$

.....

.....

.....



- d** Simplify the expression $\frac{(\sqrt{3})^{2n+3}}{(\sqrt{5})^{1-n} \times (\sqrt{15})^{n-1}}$ to its simplest form, then find the value of the result when $n = 0$

.....

.....

.....

- e** Find the arithmetic mean of the following frequency distribution:

Intervals	5–	15 –	25 –	35 –	Total
Frequency	6	8	4	m	20

.....

.....

.....

- f** If $X =] -3, 4]$, $Y = [-1, 5 [$, find the following using the number line:

(1) $X \cap Y$

(2) $X \cup Y$

(3) $X - Y$

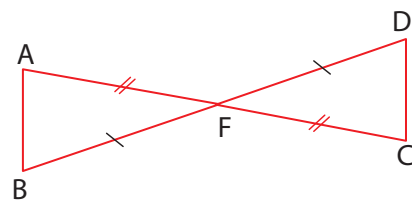
.....

.....

.....

- g** In the opposite figure: The point F is a midpoint of $\overline{AC}$, $\overline{BD}$

Prove that: $\triangle ABF \cong \triangle CDF$, $\overline{AB} \parallel \overline{DC}$



.....

.....

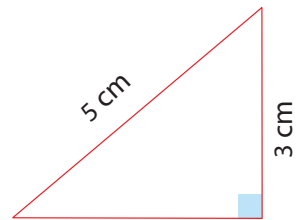
.....



1- Choose the correct answer:

9

- a What is the solution set of the equation: $x^2 + 4x - 12 = 0$ in $\mathbb{R}$?
($\{4, 3\}, \{-2, 6\}, \{-6, 2\}, \{-1, 12\}$)
- b The multiplicative inverse of the number $-2 - \sqrt{3}$ is
($-2 + \sqrt{3}, 2 - \sqrt{3}, -\sqrt{3} + 2, 2\sqrt{3}$)
- c The set of non-negative numbers is
($]-\infty, 0[$, $]0, \infty[$, $[0, \infty[$, $]-\infty, 0]$)
- d If the lengths of two sides of an isosceles triangle are 3 cm, and 8 cm, then the length of the third side is
(2 cm, 5 cm, 8 cm, 3 cm)
- e How many diagonals does a convex hexagon have?
(7, 11, 9, 14)
- f $\sqrt{35} \approx$
(6, 5.2, 6.2, -6)
- g The area of the opposite triangle is cm^2 .
(15, 6, 12, 3)
- h $\mathbb{Q} \cap \mathbb{Q}' =$
($\mathbb{Q}, \mathbb{Z}, \emptyset, \mathbb{R}$)
- i The expression that represents the opposite model:
($x^2 + 3x + 2$, $x^2 + 2x + 2$, $x^2 + x - 2$, $x^2 - 3x + 2$)



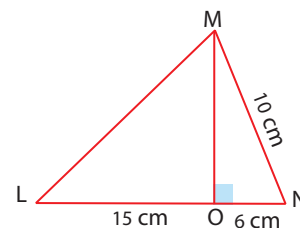
	$x + 2$		
$x + 1$	x^2	x	x
	x	1	1

2- Answer each of the following:

21

- a In the opposite figure:

Find with proof the length of $\overline{LM}$.

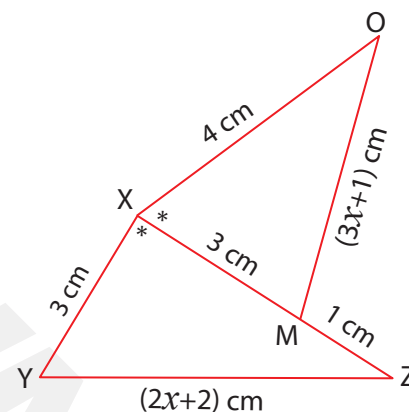


- b Find in $\mathbb{R}$ the solution set of the equation:

$$y^2 - 8y + 15 = 0$$

- c In the given figure:

Find with proof the value of x



- d If $A = [-1, 5]$, $B = [1, 7[$.

Find the following in the form of an interval using number line

(1) $A \cap B$

(2) $A \cup B$

(3) $A - B$

- e Factorize each of the following completely:

(1) $3x^2 - 23x + 14$

(2) $25a^2 - 81$

(3) $x^3 - 27$

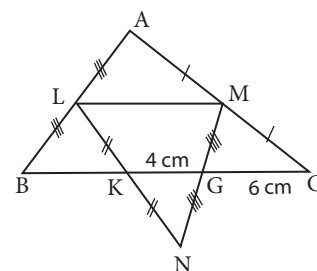
f From the opposite figure:

Find with proof the length of $\overline{BK}$

.....

.....

.....



g The opposite figure represents the ascending cumulative frequency of marks for 60 students in mathematics:

*** How many students get less than 35 marks?**

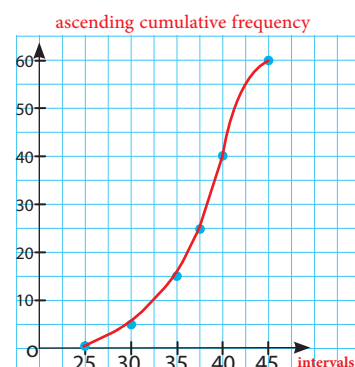
.....

*** What is the percentage of students who get less than 30 marks?**

.....

*** How many students that their marks belong to $[30,35]$?**

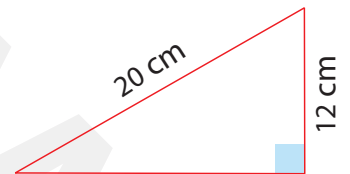
.....



1- Choose the correct answer:

9

- a Half the number 2^{10} is $(2^5, 1^9, 2^{10}, 2^9)$
- b $ax + ay - bx - by =$ $((x - y)(a + b), (x - y)(a - b), (x + y)(a + b), (x + y)(a - b))$
- c If the polynomial $(x^2 + mx + 9)$ is a perfect square, then the value of $m =$ $(\pm 9, \pm 9x, \pm 6, \pm 6x)$
- d $\sqrt{-1}$ $\mathbb{R}$ $(\subset, \not\subset, \in, \notin)$
- e $\mathbb{R} =$ $(\mathbb{R}^+ \cap \mathbb{R}^-, \mathbb{R}^+ \cup \mathbb{R}^-,]-\infty, \infty[, \mathbb{Q} \cap \mathbb{Q}')$
- f How many sides does a regular polygon have if each of its interior angles measures 120° ? $(8, 6, 9, 7)$
- g What is the result of $\sqrt[3]{2} - 2\sqrt[3]{\frac{1}{4}}$? $(0, 1, \sqrt[3]{2}, 2)$
- h If $\sum f = 50$, $\sum (f \cdot x_m) = 800$, what is the arithmetic mean $\bar{x}$? $(16, 160, 750, 850)$
- i The area of the opposite triangle = cm^2 $(96, 16, 192, 120)$



2- Answer each of the following:

21

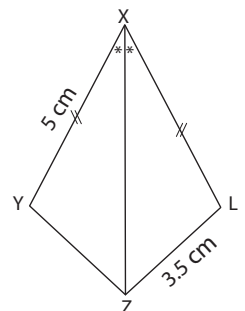
- a In the opposite figure:

$$\overline{XY} \cong \overline{XL}, XY = 5 \text{ cm}, ZL = 3.5 \text{ cm}$$

and $\overrightarrow{XZ}$ bisects $\angle YXL$

(1) Prove that: $\triangle XZY \cong \triangle XZL$

(2) Find the perimeter of the polygon XYZL.



.....

.....

.....

b Factorize each of the following completely:

(1) $2x^2 + 3x + 1$

(2) $3x^3 + 81$

.....

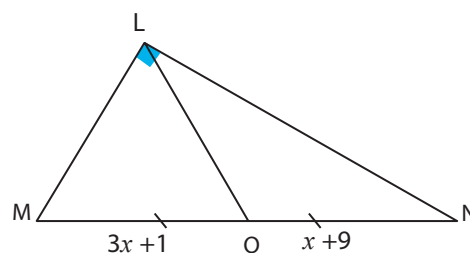
.....

.....

c In the opposite figure:

$\overline{LO}$ is a median of $\triangle LMN$,

$\triangle MNL$ is right angled at L.



Find: the length of $\overline{LO}$

.....

.....

.....

d The opposite Stem-and-leaf plot represents the number of studying hours monthly for 25 students.

* **Draw the ascending accumulative frequency curve.**

* **How many students studying less than 140 hours monthly?**

* **Find the percentage of students who studying less than 130 hours monthly.**

Stems	Leaves
11	0 1
12	1 2 3 7
13	0 4 5 6 9 9 9
14	2 3 3 8 8 9
15	0 0 2 4 6 7
Key 11 0 means 110	

.....

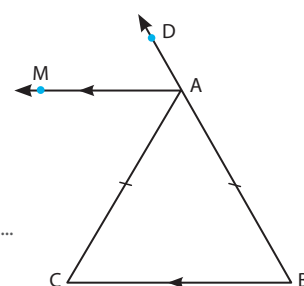
.....

.....

e In the opposite figure:

$AB = AC$, $D \in \overrightarrow{BA}$, $\overrightarrow{AM} \parallel \overrightarrow{BC}$

Prove that: $m(\angle DAM) = m(\angle CAM)$



.....

.....

.....

f If $X = [-4, 4]$, $Y = [1, 7[$

Find the following in the form of an interval using number line.

(1) $X \cap Y$

(2) $X \cup Y$

(3) $X - Y$

.....

.....

.....

g Simplify the following in simplest form:

$$2\sqrt{32} - \sqrt{18} + \sqrt{50}$$

.....

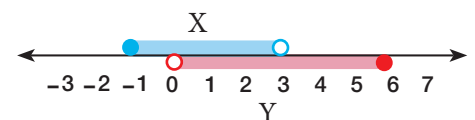
.....

.....

1- Choose the correct answer:

9

- a What is the number of medians in a right -angled triangle?
(0 , 1 , 2 , 3)
- b The set of non-positive numbers is
($]-\infty, 0]$, $]0, \infty[$, $[0, \infty[$, $]-\infty, 0[$)
- c If the lengths of two sides of an isosceles triangle are 5 cm, and 10 cm , then the length of the third side is
(5 cm , 6 cm , 10 cm , 9 cm)
- d The formula used to calculate the measure of interior angle in a regular polygon is
($\frac{(n-2) \times 180^\circ}{n}$, $\frac{(n+2) \times 180^\circ}{n}$, $\frac{(n-2) \times 180^\circ}{2}$, $\frac{(n+2) \times 180^\circ}{2}$)
- e What is the greatest common factor of the polynomial $12x^2 + 6x$?
(6 , $6x$, 2 , $2x$)
- f The value of $\sqrt{2} + \sqrt{2} =$
($-2\sqrt{2}$, $3\sqrt{2}$, 0 , $2\sqrt{2}$)
- g If the projection of point (12,32) , which lies on the cumulative frequency curve on the axis of intervals determines the median, then the order of median is
(12 , 32 , 15 , 30)
- h The solution set of the equation $x^2 + 4 = 0$ in $\mathbb{R}$ is
(0 , ± 4 , ± 2 , $\emptyset$)
- i Using the number line: $X \cup Y =$
($]-1, 6[$, $]-1, 6]$, $[-1, 6]$, $[0, 3]$)



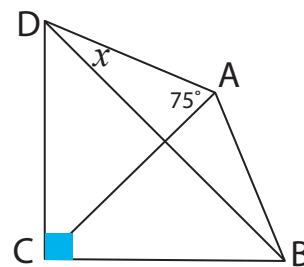
2- Answer each of the following:

21

a $BC = CD = AC$

, $m(\angle CAD) = 75^\circ$, $m(\angle DCB) = 90^\circ$

Find with proof the value of x



b Find the solution set of the following in $\mathbb{R}$:

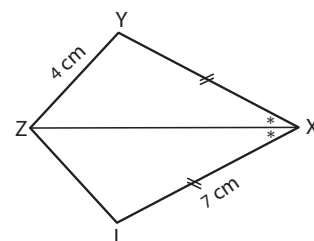
(1) $3x^2 + 11x - 20 = 0$

(2) $-x^2 + 24 = 5x$

c In the opposite figure:

$ZY = 4 \text{ cm}$, $XL = 7 \text{ cm}$, $XY = XL$,

$\overrightarrow{XZ}$ bisects $\angle YXL$,



Prove that: $\triangle XZY \cong \triangle XZL$, then find the perimeter of the polygon XYZL

d The following table shows the masses (in kg) of 20 boxes:

Intervals	45 –	50 –	55 –	60 –	65 –	70 –
Frequency	2	3	3	6	4	2

(1) Draw the ascending accumulative frequency curve.

(2) Find the number of boxes with mass less than 60 kg.

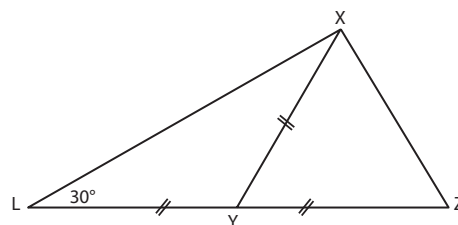
e If $x = \sqrt[3]{3} + \sqrt[3]{2}$, $y = \sqrt[3]{3} - \sqrt[3]{2}$

Find: (1) $(x + y)^3$ (2) $(x - y)^3$

f From the opposite figure

$Y \in \overline{LZ}$, $m(\angle L) = 30^\circ$.

Find with proof $m(\angle LXZ)$



g If $A =] - 4 , 1]$, $B = [- 2 , 5 [$, **find the following using the number line:**

(1) $A \cap B$

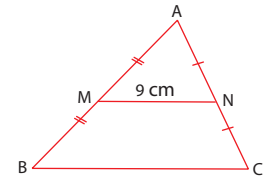
(2) $A \cup B$

(3) $B - A$

1- Choose the correct answer:

9

- a If $(x + 7)^0 = 1$, then $x \in$ $(\{-7\}, \{7\}, \mathbb{R} - \{7\}, \mathbb{R} - \{-7\})$
- b If $(36)^2 - (16)^2 = 20x$, then the value of $x =$ $(20, 25, 52, 36)$
- c If: $y^2 + 7y + 12 = (y + a)(y + b)$, what is the value of $a + b =$ $(5, 19, 7, 12)$
- d Fourth the number 2^{19} is $(2^{19}, 1^{17}, 2^{21}, 2^{17})$
- e $\sqrt{-3}$ $\mathbb{R}$ $(\subset, \not\subset, \in, \notin)$
- f In the opposite figure: The length of $\overline{BC}$ is $(12 \text{ cm}, 3 \text{ cm}, 7.5 \text{ cm}, 18 \text{ cm})$
- g $\mathbb{Q} \cap \mathbb{Q}' =$ $(\mathbb{Q}^+, \mathbb{Z}^+, \emptyset, \mathbb{R})$
- h $(x + 1)$ is one of factors of trinomial $(5x^2 + 2x - 3)$, then the other factor is $(3x - 5, 3x + 5, 5x + 3, 5x - 3)$
- i If $a + b = 5\sqrt{2}$, $c - d = \sqrt{2}$, then the value of $ac - ad + bc - bd?$ $(\sqrt{2}, 6\sqrt{2}, 10, 30)$



2- Answer each of the following:

21

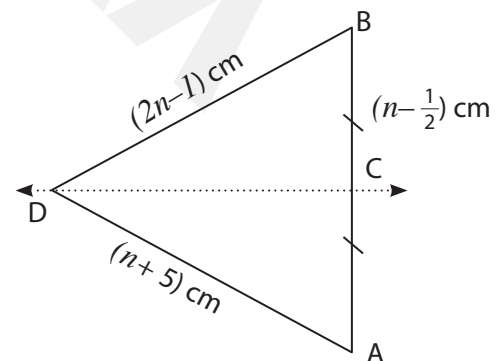
- a In the given figure:

Find $m(\angle A)$

.....

.....

.....



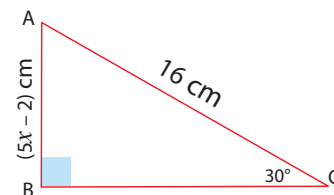
- b If $x = 2\sqrt{2}$, $y = 5$, find the value of the expression: $x^2 - y^2$

.....

.....

- c In the opposite figure,

Find the value of x , then find the area of $\triangle ABC$



- d Find the arithmetic mean of the following frequency distribution:

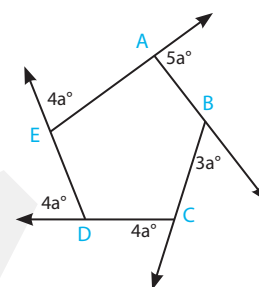
Intervals	5–	15 –	25 –	35 –	Total
Frequency	7	6	4	3	20

- e Find the solution set of the equation in $\mathbb{R}$ $x^3 + x^2 - 9x = 9$

- f In the opposite figure:

(1) Find the value of a .

(2) $m(\angle BCD)$.

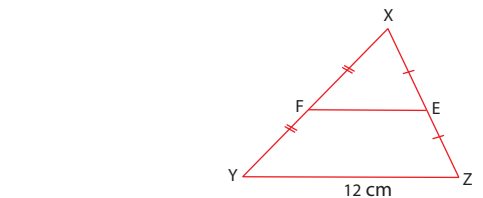
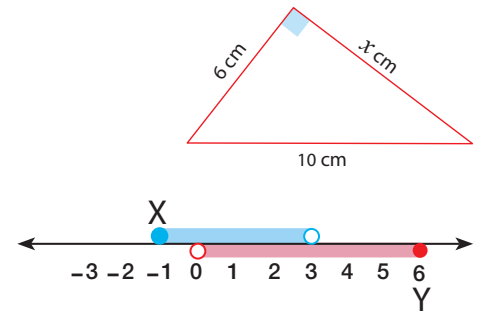


- g Factorize the following completely:

$$a^2 + 2ab + b^2 - c^2$$

1- Choose the correct answer:

- a What is the number of sides of a polygon whose sum of measures of its interior angles is 1440° ?
(10, 11, 12, 13)
- b $\mathbb{R} = \dots\dots\dots$
($\mathbb{R}^+ \cap \mathbb{R}^-$, $\mathbb{R}^+ \cup \mathbb{R}^-$, $]-\infty, \infty[$, $\mathbb{Q} \cap \mathbb{Q}'$)
- c In the opposite figure, the value of x is =
(4, 7, 8, 6)
- d Using the number line: $X - Y = \dots\dots\dots$
($] -1, 6[$, $[-1, 6]$, $[-1, 0]$, $]0, 3[$)
- e In the opposite figure: The length of $\overline{FE}$ is
(12 cm, 3 cm, 9 cm, 6 cm)
- f When completing the square for $(x^2 + 16)$, we add
($\pm 2x$, $\pm 4x$, $\pm 8x$, $\pm 12x$)
- g Each of the following is a measure of central tendency except
(the mode, the median, the mean, the range)
- h If $\Sigma f.m = 320$, $\Sigma f = 40$, then the arithmetic mean =
(8, 80, 40, 4)
- i The multiplicative inverse of the number $2 - \sqrt{3}$ is
($2 + \sqrt{3}$, $2 - \sqrt{3}$, $-\sqrt{3} + 2$, $2\sqrt{3}$)



2- Answer each of the following:

- a In the given figure:

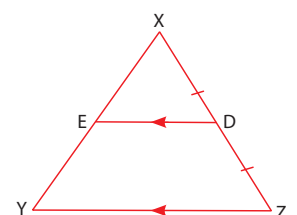
Find with proof the ratio of the length of $\overline{XE}$ to the length of $\overline{EY}$

In $\triangle XYZ$

$\therefore \overline{ED} \parallel \overline{YZ}$, the length of $\overline{XD} =$ the length of $\overline{ZD}$

$\therefore$ The length of $\overline{XE} =$ the length of $\overline{EY}$

$\therefore$ The ratio of the length of $\overline{XE}$ to the length of $\overline{EY} = 1 : 1$



- b** Find the number of sides of a convex polygon that has 9 diagonals.

$$\text{Number of diagonals} = \frac{n(n-3)}{2}$$

$$\frac{n(n-3)}{2} = 9$$

$$n(n-3) = 18$$

$$n^2 - 3n - 18 = 0$$

$$(n-6)(n+3) = 0$$

$$n = 6 \quad \text{or} \quad n = -3 \text{ (refused)}$$

The polygon has 6 sides (hexagon)

- c** ABC is a triangle, H, G and O are midpoints of $\overline{AC}$, $\overline{AB}$, and $\overline{BC}$ respectively, If the perimeter of $\triangle ABC = 36$ cm,

find the perimeter of $\triangle HGO$

In $\triangle ABC$,

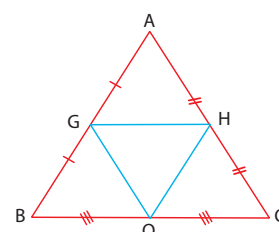
$\therefore$ H, G and O are midpoints of $\overline{AC}$, $\overline{AB}$, and $\overline{BC}$ respectively.

$$\therefore HG = \frac{1}{2} BC, HO = \frac{1}{2} AB, OG = \frac{1}{2} AC$$

$\therefore$ The perimeter of $\triangle HGO = \frac{1}{2}$ the perimeter of $\triangle ABC$

$\therefore$ The perimeter of $\triangle ABC = 36$ cm

$\therefore$ The perimeter of $\triangle HGO = 18$ cm



- d** Simplify the expression $\frac{(\sqrt{3})^{2n+3}}{(\sqrt{5})^{1-n} \times (\sqrt{15})^{n-1}}$ to its simplest form

, then find the value of the result when $n = 0$

$$\begin{aligned} \frac{(\sqrt{3})^{2n+3}}{(\sqrt{5})^{1-n} \times (\sqrt{15})^{n-1}} &= \frac{(\sqrt{3})^{2n+3}}{(\sqrt{5})^{1-n} \times (\sqrt{5})^{n-1} \times (\sqrt{3})^{n-1}} \\ &= \frac{(\sqrt{3})^{2n+3}}{(\sqrt{3})^{n-1}} = (\sqrt{3})^{n+4} \end{aligned}$$

The value when $n = 0$ is $(\sqrt{3})^{n+4} = 9$

- e Find the arithmetic mean of the following frequency distribution:

Intervals	5–	15 –	25 –	35 –	Total
Frequency	6	8	4	m	20

$$m = 20 - (6 + 8 + 4) = 2$$

Intervals	Frequency (f)	Center of intervals (x_m)	$f \cdot x_m$
5 –	6	10	60
15–	8	20	160
25–	4	30	120
35–	2	40	80
Total	20		420

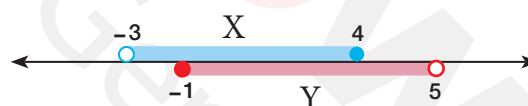
$$\bar{x} = \frac{\sum (f \cdot x_m)}{\sum f} = \frac{420}{20} = 21$$

- f If $X =]-3, 4]$, $Y = [-1, 5[$, find the following using the number line:

(1) $X \cap Y$

(2) $X \cup Y$

(3) $X - Y$



(1) $X \cap Y = [-1, 4]$

(2) $X \cup Y =]-3, 5[$

(3) $X - Y =]-3, -1[$

- g In the opposite figure: The point F is a midpoint of $\overline{AC}$, $\overline{BD}$

Prove that: $\triangle ABF \cong \triangle CDF$, $\overline{AB} \parallel \overline{DC}$

$$\therefore \overline{AC} \cap \overline{BD} = \{F\}$$

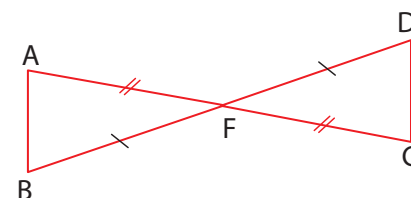
$$\therefore m(\angle AFB) = m(\angle DFC) \dots\dots (1)$$

$$\therefore \overline{FD} \cong \overline{FB}, \overline{FC} \cong \overline{FA} \dots\dots (2)$$

From (1), and (2): $\triangle ABF \cong \triangle CDF$

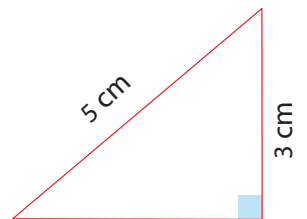
$$\therefore m(\angle D) = m(\angle B) \text{ (alternating angles and } \overline{BD} \text{ transversal)}$$

$$\therefore \overline{AB} \parallel \overline{DC}$$



1- Choose the correct answer:

- a What is the solution set of the equation: $x^2 + 4x - 12 = 0$ in $\mathbb{R}$?
 ($\{4, 3\}$, $\{-2, 6\}$, **$\{-6, 2\}$** , $\{-1, 12\}$)
- b The multiplicative inverse of the number $-2 - \sqrt{3}$ is
 (**$-2 + \sqrt{3}$** , $2 - \sqrt{3}$, $-\sqrt{3} + 2$, $2\sqrt{3}$)
- c The set of non-negative numbers is
 ($]-\infty, 0[$, $]0, \infty[$, **$[0, \infty[$** , $]-\infty, 0]$)
- d If the lengths of two sides of an isosceles triangle are 3 cm, and 8 cm, then the length of the third side is
 (2 cm, 5 cm, **8 cm**, 3 cm)
- e How many diagonals does a convex hexagon have? (7, 11, **9**, 14)
- f $\sqrt{35} \approx$ (**6**, 5.2, 6.2, -6)
- g) The area of the opposite triangle is cm^2 .
 (15, **6**, 12, 3)
- h $\mathbb{Q} \cap \mathbb{Q}' =$ ($\mathbb{Q}$, $\mathbb{Z}$, **$\emptyset$** , $\mathbb{R}$)
- i The expression that represents the opposite model:
 (**$x^2 + 3x + 2$** , $x^2 + 2x + 2$, $x^2 + x - 2$, $x^2 - 3x + 2$)



	$x + 2$		
$x + 1$	x^2	x	x
	x	1	1

2- Answer each of the following:

a In the opposite figure:

Find with proof the length of $\overline{LM}$.

In triangle MNO:

$$\therefore (OM)^2 = (MN)^2 - (ON)^2 \text{ (Pythagoras' theorem)}$$

$$\begin{aligned} \therefore (OM)^2 &= (10)^2 - (6)^2 \\ &= 100 - 36 = 64 \end{aligned}$$

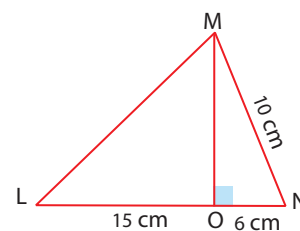
$$\therefore OM = 8 \text{ cm}$$

In Triangle LMO:

$$\therefore (LM)^2 = (LO)^2 + (MO)^2 \text{ (Pythagoras' theorem)}$$

$$\begin{aligned} \therefore (LM)^2 &= (15)^2 + (8)^2 \\ &= 225 + 64 \end{aligned}$$

$$\therefore (LM)^2 = 289 \qquad \therefore LM = 17 \text{ cm}$$



b Find in $\mathbb{R}$ the solution set of the equation:

$$y^2 - 8y + 15 = 0$$

$$y^2 - 8y + 15 = 0$$

$$(y - 3)(y - 5) = 0$$

$$y = 3, y = 5$$

$$\text{, then S. S} = \{3, 5\}$$

c In the given figure:

Find with proof the value of x

$$\therefore XO = XZ, XM = XY, m(\angle OXZ) = m(\angle YXZ)$$

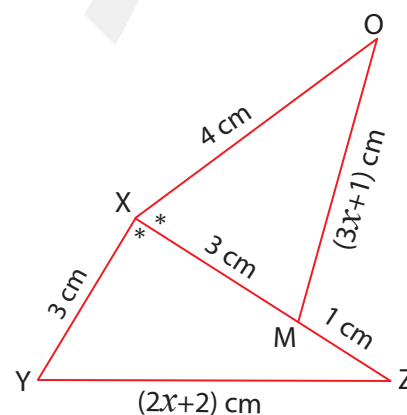
$$\therefore \triangle XOM \cong \triangle XZY$$

$$\therefore OM = ZY$$

$$\therefore 3x + 1 = 2x + 2$$

$$\therefore 2 - 1 = 3x - 2x$$

$$\therefore x = 1$$



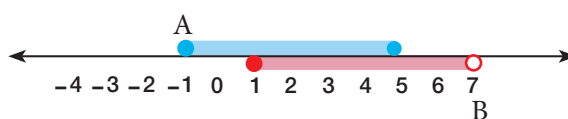
- d If $A = [-1, 5]$, $B = [1, 7[$.

Find the following in the form of an interval using number line

(1) $A \cap B$

(2) $A \cup B$

(3) $A - B$



(1) $A \cap B = [1, 5]$

(2) $A \cup B = [-1, 7[$

(3) $A - B = [-1, 1[$

- e Factorize each of the following completely:

(1) $3x^2 - 23x + 14$

(2) $25a^2 - 81$

(3) $x^3 - 27$

(1) $(3x - 2)(x - 7)$

(2) $(5a + 9)(5a - 9)$

(3) $(x - 3)(x^2 + 3x + 9)$

- f From the opposite figure:

Find with proof the length of $\overline{BK}$

In $\triangle LMN$:

$\therefore G$ is the midpoint of $\overline{MN}$, K is the midpoint of $\overline{LN}$

$\therefore KG = \frac{1}{2} LM$

$\therefore LM = 2 KG = 8 \text{ cm}$

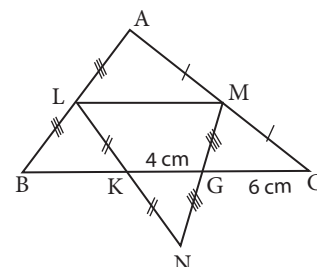
In $\triangle ABC$:

$\therefore M$ is the midpoint of $\overline{AC}$, L is the midpoint of $\overline{AB}$

$\therefore LM = \frac{1}{2} BC$

$\therefore BC = 2 LM = 16 \text{ cm}$

$\therefore BK = 16 - (6 + 4) = 6 \text{ cm}$



- g The opposite figure represents the ascending cumulative frequency of marks for 60 students in mathematics:

* How many students get less than 35 marks?

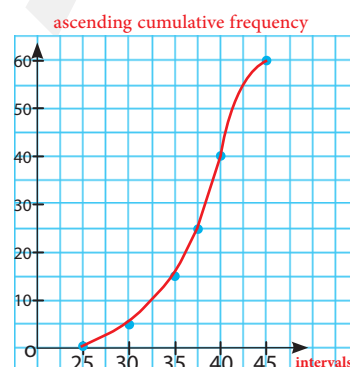
..... 15 students

* What is the percentage of students who get less than 30 marks?

..... $\frac{5}{60} \times 100\% = 8 \frac{1}{3} \%$

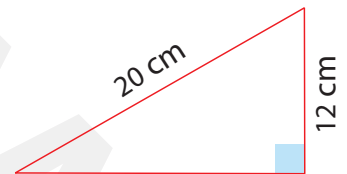
* How many students that their marks belong to $[30, 35]$?

..... $15 - 5 = 10$ students



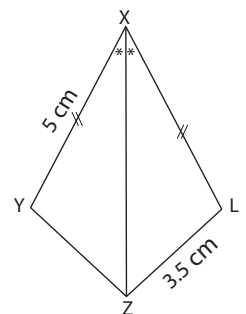
1- Choose the correct answer:

- a Half the number 2^{10} is ($2^5, 1^9, 2^{10}, 2^9$)
- b $ax + ay - bx - by =$ ($(x - y)(a + b), (x - y)(a - b), (x + y)(a + b), (x + y)(a - b)$)
- c If the polynomial $(x^2 + mx + 9)$ is a perfect square, then the value of $m =$ ($\pm 9, \pm 9x, \pm 6, \pm 6x$)
- d $\sqrt{-1}$ $\mathbb{R}$ ($\subset, \not\subset, \in, \notin$)
- e $\mathbb{R} =$ ($\mathbb{R}^+ \cap \mathbb{R}^-, \mathbb{R}^+ \cup \mathbb{R}^-,]-\infty, \infty[, \mathbb{Q} \cap \mathbb{Q}'$)
- f How many sides does a regular polygon have if each of its interior angles measures 120° ? ($8, 6, 9, 7$)
- g What is the result of $\sqrt[3]{2} - 2\sqrt[3]{\frac{1}{4}}$? ($0, 1, \sqrt[3]{2}, 2$)
- h If $\sum f = 50, \sum (f \cdot x_m) = 800$, what is the arithmetic mean $\bar{x}$? ($16, 160, 750, 850$)
- i The area of the opposite triangle = cm^2 ($96, 16, 192, 120$)



2- Answer each of the following:

- a In the opposite figure:
- $\overline{XY} \cong \overline{XL}, XY = 5 \text{ cm}, ZL = 3.5 \text{ cm}$
- and $\overrightarrow{XZ}$ bisects $\angle YXL$
- (1) Prove that: $\triangle XZY \cong \triangle XZL$
- (2) Find the perimeter of the polygon $XYZL$.



$\therefore \overrightarrow{XZ}$ bisects $\angle YXL$

$\therefore m(\angle YXZ) = m(\angle LXZ)$

In $\triangle XZY, \triangle XZL$

$\therefore XY = XL = 5 \text{ cm}$

$\therefore m(\angle YXZ) = m(\angle LXZ)$

$\therefore \overline{XZ}$ is a common side

$\therefore \triangle XZY \cong \triangle XZL$

$\therefore YZ = LZ = 3.5 \text{ cm}$

$\therefore$ The perimeter of the polygon XYZL = $3.5 + 5 + 3.5 + 5 = 17 \text{ cm}$

b Factorize each of the following completely:

(1) $2x^2 + 3x + 1$

(2) $3x^3 + 81$

(1) $2x^2 + 3x + 1 = (2x + 1)(x + 1)$

(2) $3x^3 + 81 =$

$= 3(x^3 + 27)$

$= 3(x + 3)(x^2 - 3x + 9)$

c In the opposite figure:

$\overline{LO}$ is a median of $\triangle LMN$,

$\triangle MNL$ is right angled at L.

Find: the length of $\overline{LO}$

$\therefore \triangle LMN$ is a right angled at L

$\therefore \overline{LO}$ is a median of $\triangle LMN$

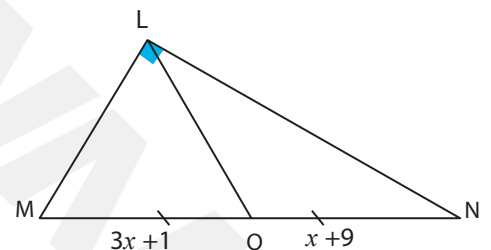
$\therefore$ The length of $\overline{LO} = \frac{1}{2}$ the length of $\overline{MN}$

$\therefore OM = ON$

$\therefore 3x + 1 = x + 9$

$\therefore 2x = 8 \qquad \therefore x = 4$

$\therefore$ The length of $\overline{LO} = 13 \text{ cm}$



- d The opposite Stem-and-leaf plot represents the number of studying hours monthly for 25 students.

* Draw the ascending accumulative frequency curve.

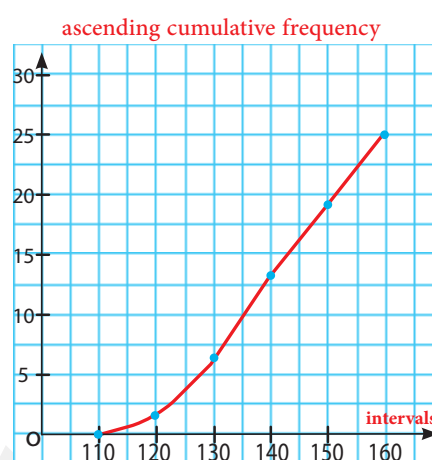
* How many students studying less than 140 hours monthly?

* Find the percentage of students who studying less than 130 hours monthly.

Stems	Leaves
11	0 1
12	1 2 3 7
13	0 4 5 6 9 9 9
14	2 3 3 8 8 9
15	0 0 2 4 6 7
Key 11 0 means 110	

Intervals	110 –	120 –	130 –	140 –	150 –
Frequency	2	4	7	6	6

Upper limits of intervals	Ascending cumulative frequency
Less than 110	0
Less than 120	2
Less than 130	6
Less than 140	13
Less than 150	19
Less than 160	25



* The number of students studying less than 140 hours monthly is 13 students.

* The percentage of students who studying less than 130 hours monthly is $\frac{6}{25} \times 100\% = 24\%$.

- e In the opposite figure:

$$AB = AC, D \in \overrightarrow{BA}, \overrightarrow{AM} \parallel \overrightarrow{BC}$$

Prove that: $m(\angle DAM) = m(\angle CAM)$

$\therefore \overrightarrow{AM} \parallel \overrightarrow{BC}$, BD is a transversal $\overrightarrow{AC}$

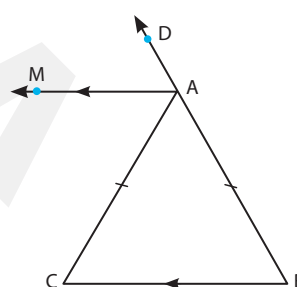
$\therefore m(\angle CAM) = m(\angle C)$ (two alternate angles)

$\therefore m(\angle DAM) = m(\angle B)$ (two corresponding angles)

$\therefore AB = AC$

$\therefore m(\angle C) = m(\angle B)$

$\therefore m(\angle DAM) = m(\angle CAM)$



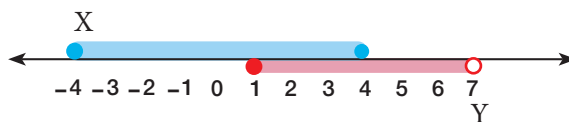
f If $X = [-4, 4]$, $Y = [1, 7[$

Find the following in the form of an interval using number line.

(1) $X \cap Y$

(2) $X \cup Y$

(3) $X - Y$



(1) $[1, 4]$

(2) $[-4, 7[$

(3) $[-4, 1[$

g Simplify the following in simplest form:

$$2\sqrt{32} - \sqrt{18} + \sqrt{50}$$

$$2\sqrt{32} - \sqrt{18} + \sqrt{50}$$

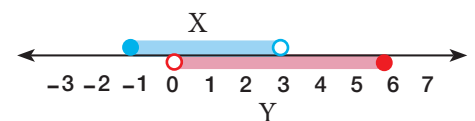
$$= 2\sqrt{16 \times 2} - \sqrt{9 \times 2} + \sqrt{25 \times 2}$$

$$= 2 \times 4\sqrt{2} - 3\sqrt{2} + 5\sqrt{2}$$

$$= 10\sqrt{2}$$

1- Choose the correct answer:

- a What is the number of medians in a right -angled triangle?
(0 , 1 , 2 , **3**)
- b The set of non-positive numbers is
(**$]-\infty, 0]$** , $]0, \infty[$, $[0, \infty[$, $]-\infty, 0[$)
- c If the lengths of two sides of an isosceles triangle are 5 cm, and 10 cm , then the length of the third side is
(5 cm , 6 cm , **10 cm** , 9 cm)
- d The formula used to calculate the measure of interior angle in a regular polygon is
(**$\frac{(n-2) \times 180^\circ}{n}$** , $\frac{(n+2) \times 180^\circ}{n}$, $\frac{(n-2) \times 180^\circ}{2}$, $\frac{(n+2) \times 180^\circ}{2}$)
- e What is the greatest common factor of the polynomial $12x^2 + 6x$?
(6 , **$6x$** , 2 , $2x$)
- f The value of $\sqrt{2} + \sqrt{2} =$
($-2\sqrt{2}$, $3\sqrt{2}$, 0 , **$2\sqrt{2}$**)
- g If the projection of point (12,32) , which lies on the cumulative frequency curve on the axis of intervals determines the median, then the order of median is
(12 , **32** , 15 , 30)
- h The solution set of the equation $x^2 + 4 = 0$ in $\mathbb{R}$ is
(0 , ± 4 , ± 2 , $\emptyset$)
- i Using the number line: $X \cup Y =$
($] -1 , 6[$, $] -1 , 6]$, **$[-1 , 6]$** , $[0 , 3]$)



2- Answer each of the following:

a $BC = CD = AC$

, $m(\angle CAD) = 75^\circ$, $m(\angle DCB) = 90^\circ$

Find with proof the value of x

In $\triangle ADC$

$\therefore CD = AC$

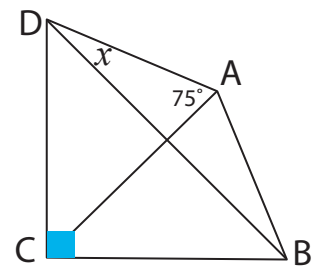
$\therefore m(\angle CDA) = m(\angle CAD) = 75^\circ$

In $\triangle DCB$

$\therefore CB = CD$

$\therefore m(\angle CDB) = m(\angle CBD) = \frac{180^\circ - 90^\circ}{2} = 45^\circ$

$\therefore x = 75^\circ - 45^\circ = 30^\circ$



b Find the solution set of the following in $\mathbb{R}$:

(1) $3x^2 + 11x - 20 = 0$

(2) $-x^2 + 24 = 5x$

(1) $3x^2 + 11x - 20 = 0$

$(3x - 4)(x + 5) = 0$

$x = \frac{4}{3}$, $x = -5$

S.S = $\{\frac{4}{3}, -5\}$

(2) $x^2 + 5x - 24 = 0$

$(x + 8)(x - 3) = 0$

$x = -8$, $x = 3$

S.S = $\{-8, 3\}$

c In the opposite figure:

$ZY = 4 \text{ cm}$, $XL = 7 \text{ cm}$, $XY = XL$,

$\overrightarrow{XZ}$ bisects $\angle YXL$,

Prove that: $\triangle XZY \cong \triangle XZL$, then find the perimeter of the polygon $XYZL$

In the $\triangle XZY, XZL$

$\therefore XY = XL$, $\overline{XZ}$ is a common side

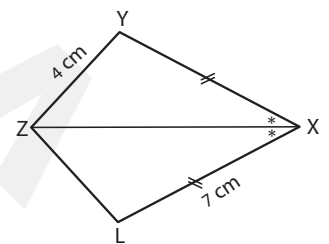
$\therefore \overrightarrow{XZ}$ bisects $\angle YXL$

$\therefore m(\angle YXZ) = m(\angle LXZ)$

$\therefore \triangle XZY \cong \triangle XZL$

$\therefore YZ = LZ = 4 \text{ cm}$, $XY = XL = 7 \text{ cm}$

$\therefore$ The perimeter of the polygon $XYZL = 7 + 4 + 4 + 7 = 22 \text{ cm}$



- d The following table shows the masses (in kg) of 20 boxes:

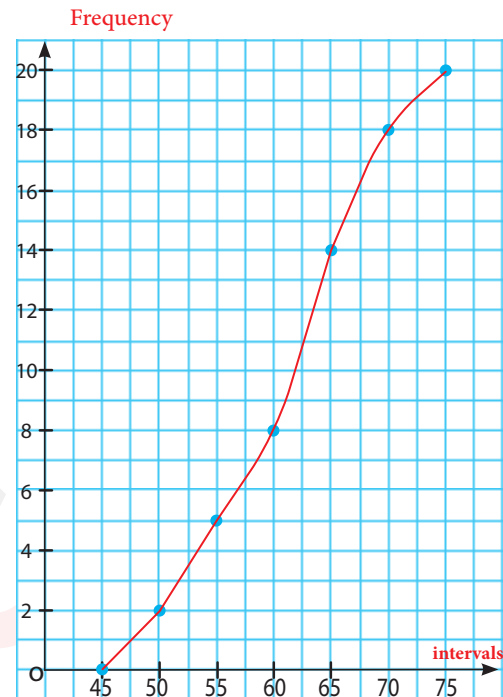
Intervals	45 –	50 –	55 –	60 –	65 –	70 –
Frequency	2	3	3	6	4	2

(1) Draw the ascending accumulative frequency curve.

(2) Find the number of boxes with mass less than 60 kg.

(1)

Upper limits of intervals	Ascending cumulative frequency
Less than 45	0
Less than 50	2
Less than 55	5
Less than 60	8
Less than 65	14
Less than 70	18
Less than 75	20



(2) The number of boxes with mass less than 60 kg = 8 boxes.

e If $x = \sqrt[3]{3} + \sqrt[3]{2}$, $y = \sqrt[3]{3} - \sqrt[3]{2}$

Find: (1) $(x + y)^3$ (2) $(x - y)^3$

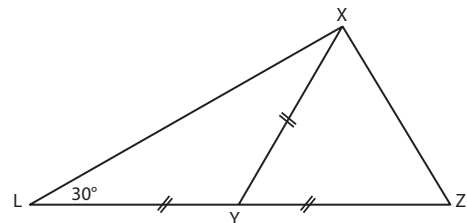
$$\begin{aligned}
 (1) (x + y)^3 &= [\sqrt[3]{3} + \sqrt[3]{2} + \sqrt[3]{3} - \sqrt[3]{2}]^3 \\
 &= (2\sqrt[3]{3})^3 \\
 &= 8 \times 3 = 24
 \end{aligned}$$

$$\begin{aligned}
 (2) (x - y)^3 &= [\sqrt[3]{3} + \sqrt[3]{2} - \sqrt[3]{3} + \sqrt[3]{2}]^3 \\
 &= (2\sqrt[3]{2})^3 \\
 &= 8 \times 2 = 16
 \end{aligned}$$

f From the opposite figure

$$Y \in \overline{LZ}, m(\angle L) = 30^\circ.$$

Find with proof $m(\angle LXZ)$



In $\triangle XYL$:

$$\therefore XY = LY$$

$$\therefore m(\angle L) = m(\angle YXL) = 30^\circ$$

$\therefore \angle XYZ$ is an exterior angle of $\triangle XYL$

$$\therefore m(\angle XYZ) = 30^\circ + 30^\circ = 60^\circ$$

In $\triangle XYZ$:

$$\therefore XY = YZ$$

$$\therefore m(\angle Z) = m(\angle ZXY) = 60^\circ$$

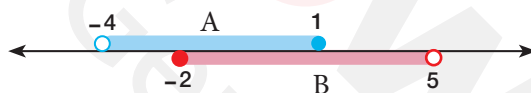
$$\therefore m(\angle LXZ) = 60^\circ + 30^\circ = 90^\circ$$

g If $A =] - 4, 1]$, $B = [- 2, 5 [$, find the following using the number line:

(1) $A \cap B$

(2) $A \cup B$

(3) $B - A$



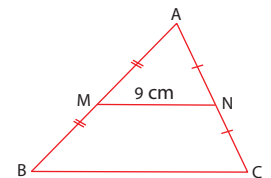
(1) $[- 2, 1]$

(2) $]- 4, 5 [$

(3) $] 1, 5 [$

1- Choose the correct answer:

- a If $(x + 7)^0 = 1$, then $x \in$ $(\{-7\}, \{7\}, \mathbb{R} - \{7\}, \mathbb{R} - \{-7\})$
- b If $(36)^2 - (16)^2 = 20x$, then the value of $x =$ $(20, 25, 52, 36)$
- c If: $y^2 + 7y + 12 = (y + a)(y + b)$, what is the value of $a + b =$ $(5, 19, 7, 12)$
- d Fourth the number 2^{19} is $(2^{19}, 1^{17}, 2^{21}, 2^{17})$
- e $\sqrt{-3}$ $\mathbb{R}$ $(\subset, \not\subset, \in, \notin)$
- f In the opposite figure: The length of $\overline{BC}$ is $(12 \text{ cm}, 3 \text{ cm}, 7.5 \text{ cm}, 18 \text{ cm})$
- g $Q \cap Q' =$ $(Q^+, Z^+, \emptyset, \mathbb{R})$
- h $(x + 1)$ is one of factors of trinomial $(5x^2 + 2x - 3)$, then the other factor is $(3x - 5, 3x + 5, 5x + 3, 5x - 3)$
- i If $a + b = 5\sqrt{2}$, $c - d = \sqrt{2}$, then the value of $ac - ad + bc - bd$? $(\sqrt{2}, 6\sqrt{2}, 10, 30)$



2- Answer each of the following:

- a In the given figure:

Find $m(\angle A)$

$$\because CB = CA, \overrightarrow{DC} \perp \overrightarrow{AB}$$

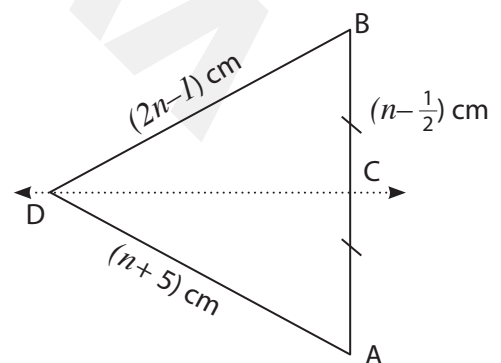
$\therefore \overline{DC}$ is an axis of symmetry of triangle ADB

$$\because D \in \overrightarrow{DC}$$

$$\therefore DB = DA$$

$$\therefore 2n - 1 = n + 5 \quad \therefore 2n - n = 5 + 1 = 6 \quad \therefore n = 6$$

$$\therefore BD = 2 \times 6 - 1 = 12 - 1 = 11 \text{ cm}$$



$$\begin{aligned}\therefore DB &= DA = 11 \text{ cm} \\ \therefore CB &= n - \frac{1}{2} \\ \therefore CB &= 6 - \frac{1}{2} = 5.5 \text{ cm} \\ \therefore CB &= CA \\ \therefore AB &= 2 \times 5.5 = 11 \text{ cm} \\ \therefore DB &= DA = AB = 11 \text{ cm} \\ \therefore \triangle DAB &\text{ is equilateral triangle} \\ \therefore m(\angle A) &= 60^\circ\end{aligned}$$

- b** If $x = 2\sqrt{2}$, $y = 5$, find the value of the expression: $x^2 - y^2$

$$\begin{aligned}x^2 - y^2 &= (x + y)(x - y) \\ &= (2\sqrt{2} + 5)(2\sqrt{2} - 5) = 8 - 10\sqrt{2} + 10\sqrt{2} - 25 \\ &= 8 - 25 = -17\end{aligned}$$

- c** In the opposite figure,

Find the value of x , then find the area of $\triangle ABC$

In $\triangle ABC$:

$$\therefore m(\angle B) = 90^\circ, m(\angle C) = 30^\circ$$

$$\therefore AB = \frac{1}{2} AC = \frac{1}{2} \times 16 = 8 \text{ cm}$$

$$\therefore 5x - 2 = 8$$

$$\therefore 5x = 8 + 2 = 10$$

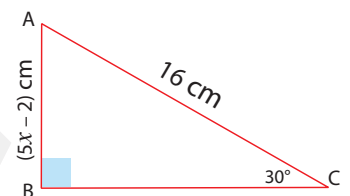
$$\therefore x = \frac{10}{5} = 2$$

$\therefore \triangle ABC$ is a right-angled at B

$$\therefore (BC)^2 = (AC)^2 - (AB)^2 = (16)^2 - (8)^2 = 192$$

$$\therefore BC = \sqrt{192} = 8\sqrt{3} \text{ cm}$$

$$\therefore \text{The area of } \triangle ABC = \frac{1}{2} \times 8 \times 8\sqrt{3} = 32\sqrt{3} \text{ cm}^2$$



- d Find the arithmetic mean of the following frequency distribution:

Intervals	5–	15 –	25 –	35 –	Total
Frequency	7	6	4	3	20

Intervals	Frequency (f)	Center of intervals (x_m)	$f \cdot x_m$
5 –	7	10	70
15–	6	20	120
25–	4	30	120
35–	3	40	120
Total	20		430

$$\bar{x} = \frac{\sum (f \cdot x_m)}{\sum f} = \frac{430}{20} = 21.5$$

- e Find the solution set of the equation in $\mathbb{R}$ $x^3 + x^2 - 9x = 9$

$$x^3 + x^2 - 9x - 9 = 0$$

$$x^2(x+1) - 9(x+1) = 0$$

$$(x^2 - 9)(x+1) = 0$$

$$(x+3)(x-3)(x+1) = 0$$

$$S.S = \{-3, 3, -1\}$$

- f In the opposite figure:

(1) Find the value of a .

(2) $m(\angle BCD)$.

$\therefore$ The sum of measures of exterior angles of a convex polygon is 360°

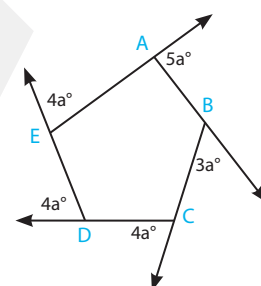
$$\therefore 5a^\circ + 3a^\circ + 4a^\circ + 4a^\circ + 4a^\circ = 360^\circ$$

$$\therefore 20a^\circ = 360^\circ$$

$$\therefore a = 360 \div 20 = 18 \quad (1)$$

$\therefore$ Measure of exterior angle at C = 72°

$$\therefore m(\angle BCD) = 180^\circ - 72^\circ = 108^\circ \quad (2)$$



g Factorize the following completely:

$$a^2 + 2ab + b^2 - c^2$$

$$a^2 + 2ab + b^2 - c^2$$

$$= (a^2 + 2ab + b^2) - c^2$$

$$= (a + b)^2 - c^2$$

$$= (a + b - c)(a + b + c)$$

حمل الآن

مجاناً وحصرياً

امتحانات رقم (3)

الترم الاول



[1] [A] Choose the correct answer:

(1) The multiplicative inverse of $-\sqrt{2}$ in the simplest form is

- a) $\sqrt{2}$ b) $\frac{1}{\sqrt{2}}$ c) $\frac{\sqrt{2}}{2}$ d) $-\frac{\sqrt{2}}{2}$

(2) $\sqrt[3]{2} - 2\sqrt[3]{\frac{1}{4}} = \dots\dots\dots$

- a) 0 b) 1 c) $\sqrt[3]{2}$ d) 2

(3) If $x^3 + y^3 = 20$, $x^2 - xy + y^2 = 4$ then $2x + 2y = \dots\dots\dots$

- a) 5 b) 10 c) 15 d) 20

[B] If $X =] - 4, 1]$, $Y = [- 2, 5 [$, by using number line:① $X \cap Y$ ② $X \cup Y$ ③ $X - Y$ 

Mr Ahmed Mosaad
01004158925

[2] [A] Choose the correct answer:

(1) The number of sides of a polygon whose sum of its interior angles is 1980° equals

- a) 10 b) 11 c) 12 d) 13

(2) If $a + b = 2\sqrt{5}$, $c - d = \sqrt{5}$ then the value of $(ac - ad + bc - bd)$ equals

- a) $\sqrt{5}$ b) $3\sqrt{5}$ c) 10 d) 20

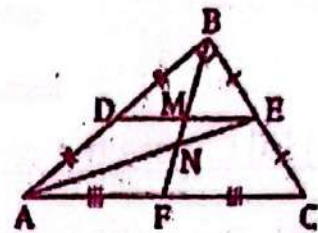
(3) If the lower limit of a set is 15, its center is 17.5 then the length of the set is

- a) 5 b) 10 c) 20 d) 25

[B] In the opposite figure

The length of $\overline{DE}$ is 6 cm.

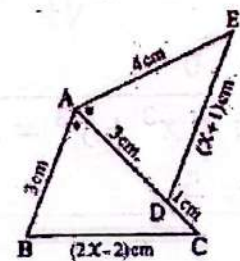
Find with proof length of $\overline{MN}$



[3] [A] Choose the correct answer:

(1) In the opposite figure

The value of x is



a) 1

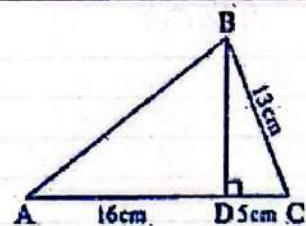
b) 2

c) 3

d) 4

(2) In the opposite figure

The length of $\overline{AB}$ is cm.



a) 12

b) 16

c) 20

d) 25

(3) The S.S of the equation: $x^2 - 4x + 3 = 0$ in R is

a) $\{1, 3\}$

b) $\{-1, -3\}$

c) $\{1, -3\}$

d) $\{-1, 3\}$

[B] Find in the simplest form $\frac{(\sqrt{3})^{2n+3}}{(\sqrt{2})^{1-n} \times (\sqrt{6})^{n-1}}$

Then find the numerical value at $n = 0$



[4] Factorize each of the following

(1) $4x^2 - 25$

(2) $x^3 - 8$

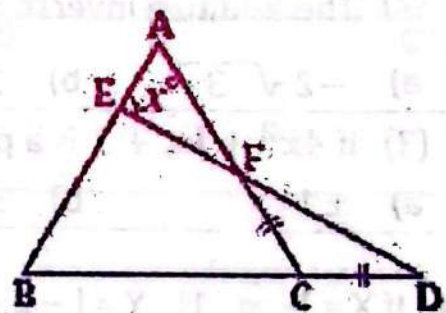
(3) $4x^2 + 14x - 30$

[B] In the opposite figure

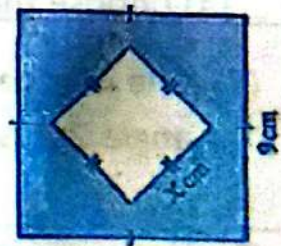
ABC is an equilateral triangle

$\overline{AC} \cap \overline{ED} = \{F\}$, $CF = CD$

Find with proof the value of x



[5] [A] Express the shaded area as a product of two factors



[B] Calculate the mean for the following frequency table

Sets	5-	15-	25-	35-	Sum
Frequency	6	8	K	2	20

End of the questions



Prep 2 - Model No 2

[1] [A] Choose the correct answer:

(1) If $x \in \mathbb{Z}$, $x < \sqrt{29} < x + 1$, then $x = \dots\dots\dots$

- a) 4 b) 5 c) 6 d) 7

(2) The additive inverse of $\frac{6}{\sqrt{2}}$ is $\dots\dots\dots$

- a) $-2\sqrt{3}$ b) $2\sqrt{3}$ c) $-3\sqrt{2}$ d) $3\sqrt{2}$

(3) If $4x^2 + kx + 1$ is a perfect square trinomial then $k = \dots\dots\dots$

- a) ± 1 b) ± 2 c) ± 4 d) ± 8

[B] If $X =]-\infty, 1]$, $Y = [-2, \infty[$, find using number line :

① $X \cap Y$

② $X \cup Y$

③ $X - Y$

[2] [A] Choose the correct answer:

(1) The number of sides of the regular Polygon whose measure of its angle 20° is $\dots\dots\dots$

- a) 12 b) 14 c) 16 d) 18

(2) If $x - y = 3$, $x + y = 9$ then the value of $\sqrt[3]{y^2 - x^2}$ is $\dots\dots\dots$

- a) -27 b) 9 c) 3 d) -3

(3) If the projection of the point (35 , 5) of the ascending accumulative curve on sets axis determine the median, then the order of the median is $\dots\dots\dots$

- a) 5 b) 10 c) 35 d) 70

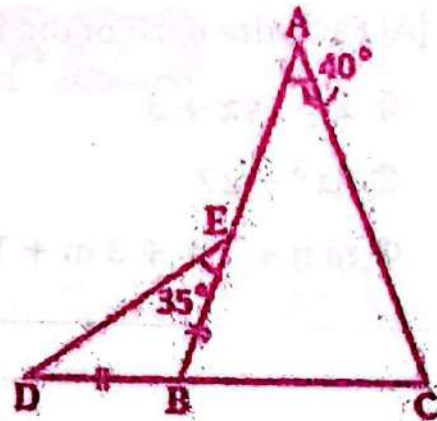


[B] In the opposite figure

$D \in \overline{CB}$, $m(\angle DEB) = 35^\circ$

$BE = BD$, $m(\angle A) = 40^\circ$

Prove that: $AB = AC$



[3] [A] Choose the correct answer:

(1) If M is the centroid of $\triangle ABC$, $\overline{BD}$ is a median, then $BD : MD =$:

- a) 2 : 3 b) 1 : 3 c) 3 : 2 d) 3 : 1

(2) Which All of the following numbers could be a sides of a right-angled triangle?

- a) 7, 7, 4 b) 12, 5, 13 c) 5, 8, 7 d) 3, 7, 5

(3) If $x^3 - 8 + m = (x + 1)(x^2 - x + 1)$ then $m =$

- a) 1 b) -1 c) 9 d) -9

[B] Find in the simplest form the value of $\frac{(\sqrt{5})^n \times (\sqrt{3})^{2-n}}{3 \times (\sqrt{15})^{-n}}$, then find the numerical value at $n = -2$



[4] [A] Factorize each of the following perfectly:

① $x^2 - 4x + 3$

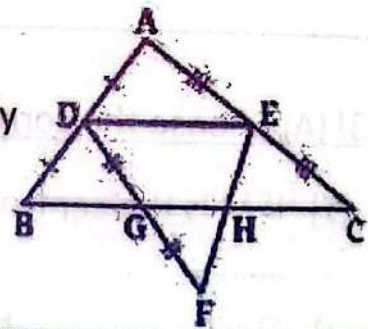
② $8x^3 - 27$

③ $mn + 5n + 3m + 15$

[B] In the opposite figure

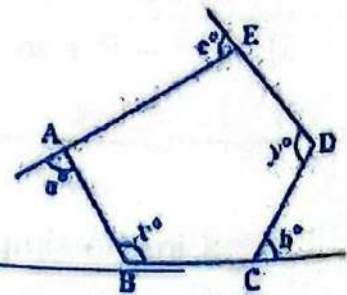
D, C, G are midpoints of $\overline{AB}$, $\overline{AC}$, $\overline{DF}$ respectively

Prove that: $BC = 4GH$



[5] [A] In the opposite figure

If $x + y = 230^\circ$, Find with proof the value of $a + b + c$



[B] Find the arithmetic mean for the following frequency distribution

Sets	50 -	150 -	250 -	350 -	450 -	Sum
Frequency	7	10	12	13	8	50

End of the questions



Prep 2 - Model No 3

[1] [A] Choose the correct answer:

(1) $[2, 5] -]2, 5[= \dots\dots\dots$

- a) $[2, 5]$ b) $]2, 5[$ c) $\{2, 5\}$ d) $]2, 5]$

(2) $\frac{\sqrt{63}}{\sqrt{7}} = \dots\dots\dots$

- a) 3 b) $\sqrt{3}$ c) 9 d) ± 3

(3) If $(x - 1)$ is a factor of $x^2 - 4x + 3$ then the other factor is

- a) $x + 3$ b) $x - 3$ c) $x + 1$ d) $x - 1$

[B] Find in the simplest form: $5\sqrt[3]{2} - \sqrt[3]{16} + \sqrt[3]{-54}$

[2] [A] Choose the correct answer:

(1) The length of the hypotenuse is the length of opposite side to angle of measure 30° in the right-angled triangle.

- a) $\frac{1}{2}$ b) $\frac{1}{3}$ c) $\frac{1}{4}$ d) 2

(2) If $2^x = 3$, then the value of $2^{x+1} = \dots\dots\dots$

- a) 4 b) 5 c) 6 d) 9

(3) If the lower limit of a set is 60 and this upper limit is 70, then its center is

- a) 60 b) 65 c) 70 d) 75



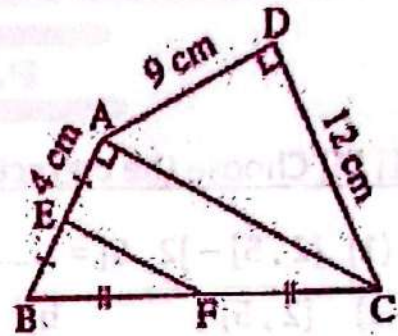
[B] In the opposite figure

ABCD is a quadrilateral,

F, E are midpoints of $\overline{BC}$, $\overline{AB}$, respectively

$m(\angle D) = m(\angle BAC) = 90^\circ$

Find area of $\triangle BEF$



[3] [A] Choose the correct answer:

(1) If $\angle A$ complement $\angle B$ in $\triangle ABC$, then $(AB)^2 \dots (AC)^2 + (BC)^2$

a) = b) < c) > d) $\neq$

(2) If $\overline{AB} \cong \overline{CD}$, $AB = 5$ cm. then: $2AB + 2CD = \dots$

a) 20 b) 10 c) 5 d) 0

(3) If $x^2 - ax + 12$ can be factorized, then a may be equal $\dots$

a) 1 b) -1 c) 7 d) 4

[B] If $x = \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$, then find in the simplest form the value of $x + \frac{1}{x}$



[4]

[A] Factorize each of the following perfectly:

① $x^2 - 4$

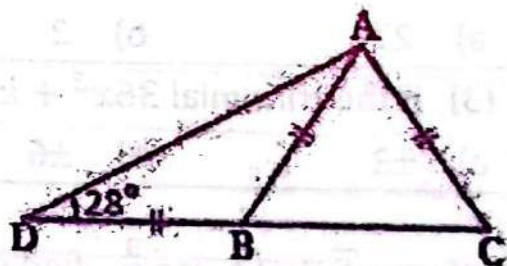
② $x^3 + 27y^3$

③ $x^2 - 5x - 36$

[B] In the opposite figure

$AB = AC = BD$, $M(\angle D) = 28^\circ$

Find with proof: $M(\angle CAD)$

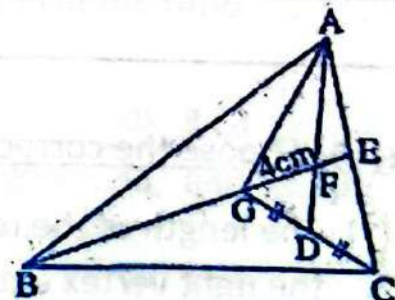


[5] [A] In the opposite figure

G is the centroid of the triangle ABC

$DC = DG$, $GF = 4\text{cm}$

Find with proof: The length of $\overline{BE}$



[B] Find the arithmetic mean for the following frequency distribution

Sets	10 -	20 -	30 -	40 -	50 -	Sum
Frequency	8	12	14	9	7	50

End of the questions



Prep 2 - Model No

4

[1] [A] Choose the correct answer:

(1) The sum of real numbers in the interval $[-75, 75]$ is

- a) -75 b) 75 c) 0 d) 150

(2) If $\sqrt{x} = \sqrt[3]{3} \times \sqrt[3]{9}$ then the value of x is

- a) 27 b) 3 c) 9 d) 18

(3) If the trinomial $36x^2 + kx + 1$ is a perfect square then $k = \dots\dots$

- a) ± 3 b) ± 6 c) ± 9 d) ± 12

[B] If $x = \sqrt{5} + \sqrt{2}$, $y = \frac{3}{x}$, find in the simplest form of value of $x + y$

[2] [A] Choose the correct answer:

(1) The length of the median of the right-angled triangle drawn from the right vertex equals the length of hypotenuse

- a) $\frac{1}{2}$ b) $\frac{1}{3}$ c) 3 d) 2

(2) The quarter of the number 2^{14} equals

- a) 2^{12} b) 2^8 c) 2^{10} d) 4^{10}

(3) If the lower limit of a set is 18 and its center is 20 then its length is

- a) 4 b) 5 c) 6 d) 10



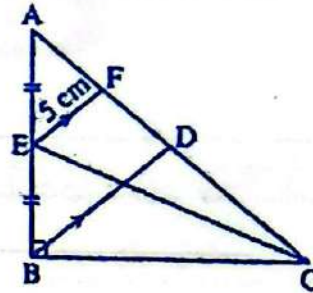
[B] In the opposite figure

If ABC is a right-angled triangle at B,

$\overline{BD}$ and $\overline{CE}$ are two medians,

$\overline{EF} \parallel \overline{BD}$, $EF = 5 \text{ cm}$

Find: The length of $\overline{AC}$



[3] [A] Choose the correct answer:

(1) The centroid of a triangle divides each median in the ratio : ... from the base.

- a) 1 : 2 b) 1 : 3 c) 2 : 1 d) 3 : 1

(2) If The number of diagonals of a convex Polygon is 35, and its side length is 10 cm, Then its perimeter equals cm.

- a) 100 b) 25 c) 45 d) 350

(3) $(\sqrt{2} - 1)^{10} (\sqrt{2} + 1)^{10} = \dots\dots\dots$

- a) 1 b) -1 c) 10 d) -10

[B] Find the simplest form the value of: $\frac{2^{2n+1} \times 3^{2n+1}}{6^{2n}}$



[4] [A] find in R the solution set of the equation:

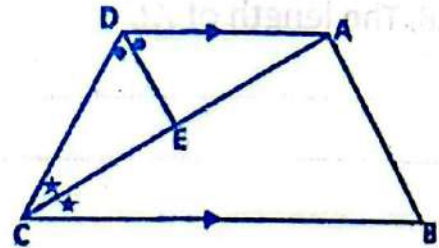
$$x^2 - 7x + 10 = 0$$

[B] In the opposite figure

$\overline{AB} \parallel \overline{BC}$, $\overline{DE}$ bisects $\angle ADC$

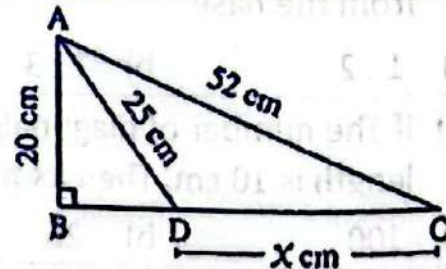
$\overline{CA}$ bisects $\angle BCD$

Prove that: $\overline{DE} \perp \overline{AC}$



[5] [A] In the opposite figure

Find with proof: The value of x



[B] Find the mode for the following frequency distribution

Sets	2 -	4 -	6 -	8 -	10 -
Frequency	3	10	12	10	5

End of the questions

FIRST SEMESTER

12



Prep 2 - Model No

5

[1] [A] Choose the correct answer:(1) If a, b are two consecutive integers, $a < \sqrt{11} < b$, then $\sqrt{a^2 + b^2} =$

- a) 5 b) 10 c) 15 d) 20

(2) The sixth of the number $2^{12} \times 3^{12}$ is

- a) 6^2 b) 6^4 c) 6^{11} d) 6^{23}

(3) If $x^2 + 2xy + y^2 = 36$ then the value of $x + y =$

- a) 6 b) -6 c) ± 6 d) ± 18

[B] Find the simplest forms the value of: $\frac{3}{2} \sqrt[3]{256} - \frac{12}{\sqrt[3]{16}} + \sqrt[3]{32}$

.....

.....

.....

[2] [A] Choose the correct answer:(1) If $\triangle ABC \cong \triangle XYZ$, $m(\angle A) + m(\angle B) = 130^\circ$, then $m(\angle Z) = \dots\dots\dots^\circ$

- a) 65 b) 50 c) 100 d) 130

(2) If $2^{x-1} = 1$ then the value of x is

- a) 0 b) 1 c) -1 d) -2

(3) If the upper limit of a set is 18 and its center is 15.5 then its lower limit is

- a) 12 b) 12.5 c) 13 d) 13.5

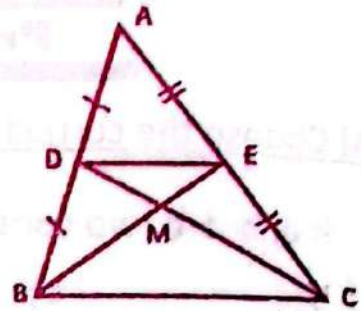


[B] In the opposite figure

D, E are midpoints of $\overline{AB}$, $\overline{AC}$ respectively

BM = 4 cm, CM = 6 cm, BC = 8 cm,

Find: The perimeter of $\triangle DME$



[3] [A] Choose the correct answer:

(1) In thirty six triangle the ratio between the length of hypotenuse and the length of the opposite side to the angle of measure 30° is

- a) 1 : 2 b) 2 : 1 c) 1 : 1 d) 1 : 3

(2) If the sum of measures of interior angles of a convex polygon is 1080° and its perimeter is 40 cm, then its side length is cm

- a) 10 b) 5 c) 15 d) 20

(3) $4^3 + 4^3 + 4^3 + 4^3 = \dots\dots\dots$

- a) 4^4 b) 16^3 c) 4^{12} d) 4^{81}

[B] Find the simplest form the value of: $\frac{4^{x+1} \times 9^{2-x}}{6^{2x}}$ then find the numerical value at $x = 3$



[4] [A] Factorize each of the following perfectly:

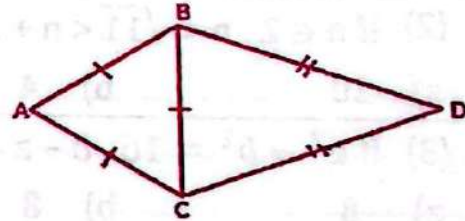
① $4x^4 + 1$

② $3x^2 + 7x + 2$

[B] In the opposite figure

$AB = BC = AC$, $m(\angle ABD) = 130^\circ$

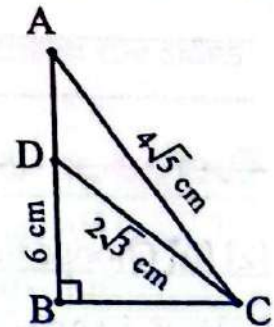
Find with proof: $m(\angle D)$



[5] [A] In the opposite figure

$m(\angle B) = 90^\circ$, $BD = 6 \text{ cm}$, $DC = 2\sqrt{3} \text{ cm}$, $AC = 4\sqrt{5} \text{ cm}$

Find with proof: The length of $\overline{AD}$



[B] Find the value of x and arithmetic mean for the following frequency distribution.

Sets	1 -	3 -	5 -	7 -	9 -	Sum
Frequency	2	3	x	4	1	50

End of the questions



Mr Ahmed Mosaad
01004158925

FIRST SEMESTER

15

Prep 2 - Model No

6

[1] [A] Choose the correct answer:

(1) $[-3, 4] \cap [2, 6] = \dots\dots\dots$

- a) $[-3, 6]$ b) $[-3, 2]$ c) $[4, 6]$ d) $[2, 4]$

(2) If $n \in \mathbb{Z}$, $n < \sqrt{11} < n+1$, then $n = \dots\dots\dots$

- a) 10 b) 4 c) 3 d) -3

(3) If $a^2 - b^2 = 16$, $b - a = 2$ then $a + b = \dots\dots\dots$

- a) -8 b) 8 c) -4 d) 4

[B] Find the simplest forms the value of: $\sqrt{18} + 3\sqrt[3]{\frac{1}{3}} - \sqrt{8} - \sqrt[3]{9}$

.....

.....

.....

[2] [A] Choose the correct answer:

(1) If $\triangle ABC \cong \triangle XYZ$, $m(\angle A) = 60^\circ$, $m(\angle B) = 50^\circ$, then $m(\angle Z) = \dots\dots\dots^\circ$

- a) 60 b) 50 c) 110 d) 70

(2) $3^x + 3^x + 3^x = \dots\dots\dots$

- a) 3^{2x} b) 3^{x+1} c) 3^x d) 9^{x+1}

(3) The arithmetic mean of the values: $4 - x$, $5 + 2x$, $3 - x$ is

- a) 3 b) 4 c) 5 d) 6



Mr Ahmed Mosaad
01004158925

أحمد مosaad
01004158925

FIRST SEMESTER

16

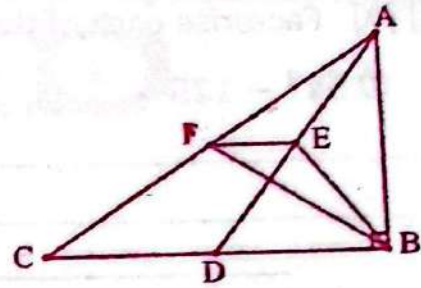
[B] In the opposite figure

$M(\angle ABC) = 90^\circ$, F is midpoint of $\overline{AC}$

E is midpoint of $\overline{AD}$, $AD = 10$ cm, $CD = 6$ cm

$AC = 12$ cm

Find: The perimeter of $\triangle EBF$



[3] [A] Choose the correct answer:

(1) Which of the following numbers could be the lengths of the sides of an obtuse-angled triangle?

- a) 24, 10, 27 b) 2.5, 2, 1.5 c) 7, 7, 7 d) 20, 10, $10\sqrt{3}$

(2) The measure of the exterior angle of equilateral triangle is°

- a) 30 b) 60 c) 150 d) 120

(3) If $(2x + 1)$ is a factor of $2x^2 + 3x + 1$ then the other factor is

- a) $2x + 1$ b) $x - 1$ c) $x + 1$ d) $x + 2$

[B] If $x = 2\sqrt{2} - 1$, $y = \frac{1}{2\sqrt{2} - 1}$ find the value $\frac{x+y}{xy}$



[4] [A] Factorize each of the following perfectly:

① $5x^2 - 125$

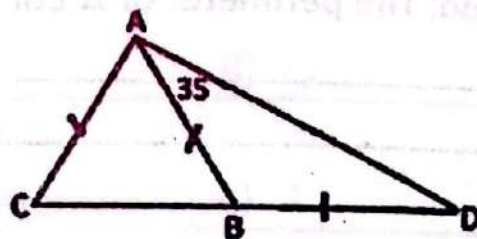
② $8 - x^3$

③ $4x^2 - 12x + 9$

[B] In the opposite figure

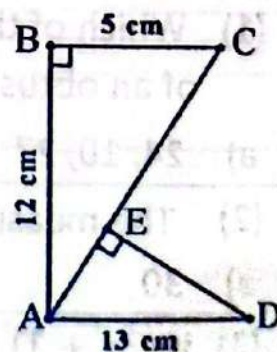
$AB = AC = BD$, $m(\angle BAD) = 35^\circ$

Find with proof: $m(\angle BAC)$



[5] [A] In the opposite figure

$m(\angle B) = 90^\circ$, $m(\angle AED) = 90^\circ$,
 $BC = 5$ cm., $AB = 12$ cm, $AD = 13$ cm
 Find with proof: The length of $\overline{EC}$



[B] Find the arithmetic mean for the following frequency distribution.

Sets	5-	15-	25-	35-	Sum
Frequency	6	8	4	2	20

End of the questions



Prep 2 - Model No

7

[1] [A] Choose the correct answer:

(1) If $x \in [-2, 2]$ then $x^2 \in$

- a) $\{4\}$ b) $]0, 4[$ c) $[0, 4]$ d) $[-4, 4]$

(2) $\sqrt{8} - \sqrt{2} =$

- a) $\sqrt{6}$ b) $\sqrt{2}$ c) 1 d) 2

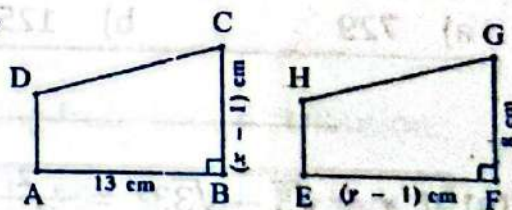
(3) If the trinomial: $x^2 + 14x + b$ is perfect square, then $b =$

- a) 4 b) 7 c) 14 d) 49

[B] Find the simplest forms the value of: $\sqrt[3]{24} - 3\sqrt[3]{\frac{1}{9}} + \sqrt[3]{-81} - \sqrt[3]{3}$

[2] [A] Choose the correct answer:

(1) If polygon EFGH is the image of the Polygon ABCD by a translation then $x + y =$



- a) 9 b) 12 c) 21 d) 22

(2) The quarter of the number $(\sqrt{2})^{12}$ is

- a) $(\sqrt{2})^3$ b) 2^3 c) 2^4 d) 12

(3) The median of the values: 8, 7, 2, 5, 4, 3, 6 is

- a) 5 b) 6 c) 7 d) 8

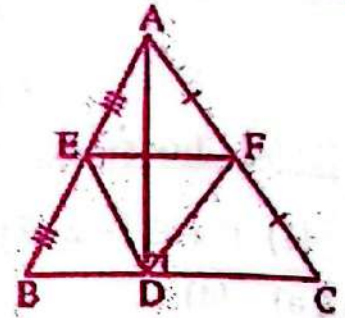


[B] In the opposite figure

$\overline{AD} \perp \overline{BC}$, E, F are midpoints of $\overline{AB}$, $\overline{AC}$ respectively

AC = 10 cm, BC = 12 cm, AB = 8 cm

Find: The perimeter of $\triangle EDF$



[3] [A] Choose the correct answer:

(1) If the lengths of two sides in an isosceles triangle are 3 cm, 7 cm then the length of the third side is cm

- a) 3 b) 4 c) 7 d) 10

(2) The number of diagonals of convex heptagon is

- a) 7 b) 11 c) 13 d) 14

(3) If $3^x = 5$, then $27^x = \dots\dots\dots$

- a) 729 b) 125 c) 25 d) 9

[B] If $x = \sqrt{5} - \sqrt{3}$ and $3^y = \frac{2}{\sqrt{5}-\sqrt{3}}$, find the value $(x + y)^2$



[4] [A] Factorize each of the following perfectly:

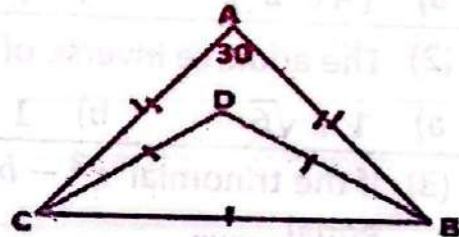
① $x^4 - 8x$

② $ax - ay + x - y$

[B] In the opposite figure

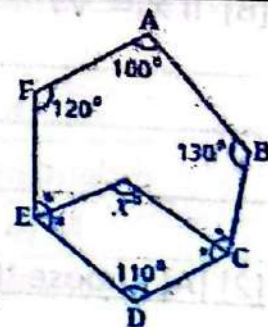
$DB = DC = BC$, $AB = AC$, $m(\angle A) = 30^\circ$

Find with proof: $m(\angle ABD)$



[5] [A] In the opposite figure

Find with proof: The value of x



[B] Find the arithmetic mean for the following frequency distribution.

Sets	4 -	8 -	12 -	16 -	20 -	Sum
Frequency	12	4	8	6	4	20



End of the questions

Mr Ahmed Mosaad
01004158925

Prep 2 - Model No

8

[1] [A] Choose the correct answer:

(1) The S.S of the equation $\sqrt{2}x = 4$ in R is

- a) $\{4\sqrt{2}\}$ b) $\{2\sqrt{2}\}$ c) $\{8\sqrt{2}\}$ d) $\{\sqrt{2}\}$

(2) The additive inverse of $\sqrt{6} - 1$ is

- a) $1 + \sqrt{6}$ b) $1 - \sqrt{6}$ c) $-1 - \sqrt{6}$ d) $-1 + \sqrt{6}$

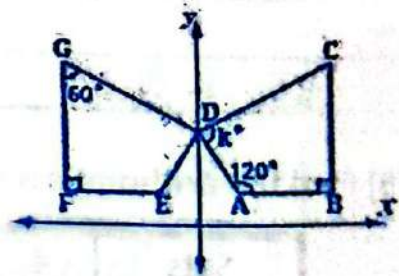
(3) If the trinomial $x^2 - bx - 14$ can be factorized, then b may be equal

- a) -15 b) 15 c) -5 d) 14

[B] If $x = \sqrt{7} + \sqrt{5}$, $xy = 2$, find the value of $\frac{x+y}{xy}$

[2] [A] Choose the correct answer:

(1) If polygon EFGD is the image of the Polygon ABCD by reflection on x-axis then $k = \dots\dots\dots^\circ$



- a) 90 b) 60 c) 70 d) 120

(2) If $3^x = 5$, $3^y = 7$ the value of 3^{x+y} is

- a) 12 b) 2 c) 9 d) 35

(3) The arithmetic mean of 5 values is 12, then their sum =

- a) 30 b) 50 c) 60 d) 120

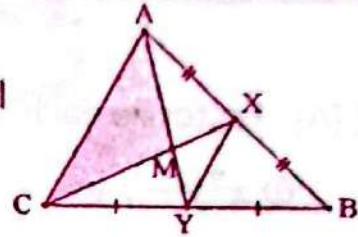


[B] In the opposite figure

$\overline{AY} \cap \overline{CX}$, X, Y are midpoints of $\overline{AB}$, $\overline{BC}$ respectively

$XY = 6$ cm, $MY = 4$ cm, $XC = 9$ cm

Find: The perimeter of $\triangle AMC$



[3] [A] Choose the correct answer:

(1) If the lengths of two sides in an isosceles triangle are 5 cm, 11 cm then the length of the third side is cm

- a) 5 b) 11 c) 6 d) 16

(2) The number of sides of convex polygon with 7 diagonals is

- a) 7 b) 5 c) 9 d) 4

(3) If $x^3 + 27 = (x + 3)(x^2 + k + 9)$ then the value of k is

- a) $-6x$ b) $-3x$ c) $3x$ d) $6x$

[B] Put $\frac{2^{2n+1} \times 5^{2n+1}}{10^{2n}}$ in the simplest form



[4] [A] Factorize each of the following perfectly:

① $x^3y - xy^3$

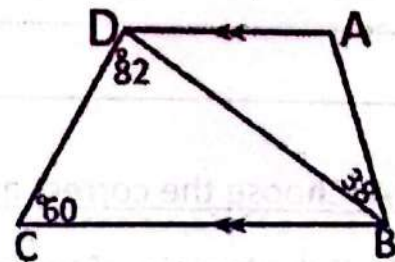
② $x^2 - y^2 + 4x - 4y$

[B] In the opposite figure

$\overline{AD} \parallel \overline{BC}$, $m(\angle ABD) = 38^\circ$, $m(\angle BDC) = 82^\circ$

$m(\angle C) = 60^\circ$

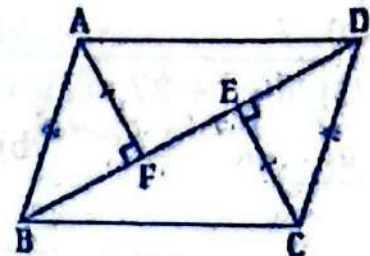
Prove that: $\triangle ABD$ is an isosceles triangle



[5] [A] In the opposite figure

$AF = CE$, $AB = CD$, $\overline{AF} \perp \overline{BD}$, $\overline{CE} \perp \overline{BD}$

Prove that: ABCD is a parallelogram



[B] Find the arithmetic mean for the following frequency distribution.

Sets	4 -	8 -	12 -	16 -	20 -	Sum
Frequency	12	4	8	6	4	20

End of the questions



Prep 2 - Model No

9

[1] [A] Choose the correct answer:(1) If $x^2 + mx + 25$ is a perfect square trinomial then $m = \dots\dots\dots$

- a) 10 b) -10 c) ± 10 d) ± 20

(2) Complete in the same pattern: $\sqrt{2}, \sqrt{8}, \sqrt{18}, \sqrt{32}, \dots\dots\dots$

- a) $\sqrt{50}$ b) $\sqrt{49}$ c) $\sqrt{48}$ d) $\sqrt{44}$

(3) If $(x + 3)(2x + m) = ax^2 + 11x + c$ then $\frac{ac}{m} = \dots\dots\dots$

- a) 37.5 b) 6 c) $\frac{2}{3}$ d) 30

[B] Factorize each of the following perfectly:

① $x^2 + 5x - 6$

② $x^2 - 100$

[2] [A] Choose the correct answer:(1) $\{1, 4\} - \{4\} = \dots\dots\dots$

- a) $\{1, 2, 3\}$ b) $[1, 4[$ c) $]1, 4]$ d) $]1, 4[$

(2) If $n < \sqrt{17} < n + 1$, where $n \in \mathbb{Z}$, then $n = \dots\dots\dots$

- a) 2 b) 3 c) 4 d) 5

(3) If $x^3 + k = (x + k)(x^2 + 3x + k^2)$, then $k = \dots\dots\dots$

- a) 3 b) -3 c) 27 d) -27

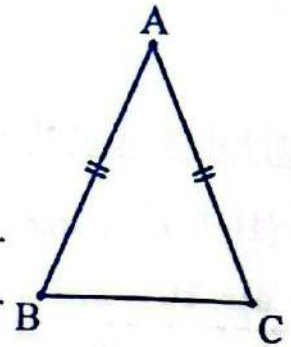


[B] In the opposite figure

$$AB = AC, m(\angle B) = (3x + 5)^\circ,$$

$$m(\angle C) = (5x - 35)^\circ$$

Find with proof: $m(\angle A)$



[3] [A] Choose the correct answer:

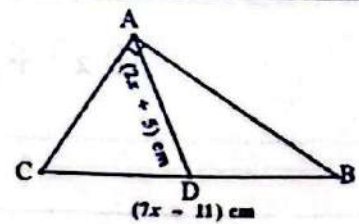
(1) In $\triangle XYZ$, $m(\angle Y) = 90^\circ$, $XZ = 5$ cm, $XY = 4$ cm, then $YZ = \dots\dots\dots$

- a) 2 b) 3 c) 1 d) 3.5

(2) In the opposite figure

$\overline{AD}$ is a median in $\triangle ABC$, $m(\angle BAC) = 90^\circ$

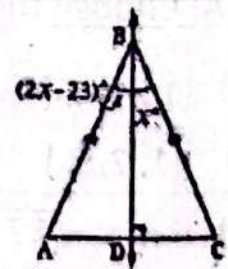
Then $x = \dots\dots\dots$ cm



- a) 2 b) 3 c) 5 d) 7

(3) In the opposite figure

$x = \dots\dots\dots^\circ$

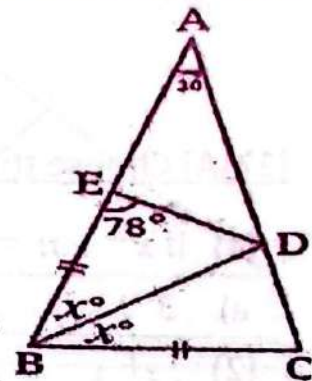
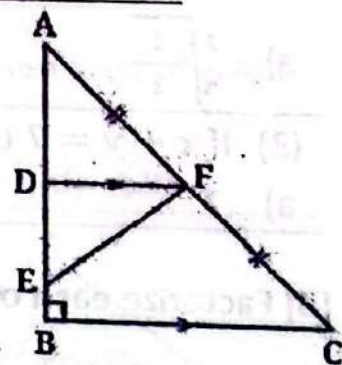


- a) 23 b) 67 c) 37 d) 73

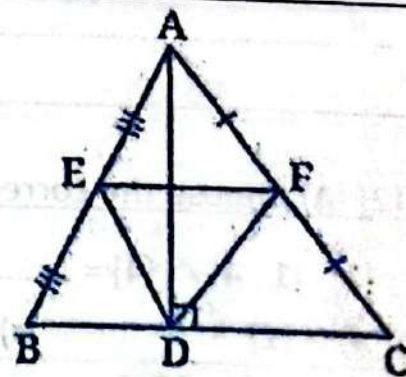
[B] Find in R the S.S of the equation $10x^3 - 25x = 0$



[4]

[A] In the opposite figureFind with proof the value of x [B] In the opposite figure $AB = BC = 16 \text{ cm.}$, $BE = 2 \text{ cm.}$ Find with proof: the length of $\overline{FE}$ [5] [A] In the opposite figure

Prove that:

Perimeter of $\triangle EFD = \frac{1}{2}$ Perimeter of $\triangle ABC$ 

[B] Find the arithmetic mean for the following frequency distribution.

Sets	0 -	6 -	12 -	18 -	24 -	Sum
Frequency	6	8	12	10	4	40

◆◆◆

End of the questions



Prep 2 - Model No

10

[1] [A] Choose the correct answer:

(1) If $x^2 + n = (x - 3)(x + 3)$ then $n = \dots\dots\dots$

- a) 3 b) -3 c) 9 d) -9

(2) $2\sqrt[3]{\frac{1}{2}} = \dots\dots\dots$

- a)
- $\sqrt[3]{\frac{1}{2}}$
- b)
- $\sqrt[3]{2}$
- c)
- $\sqrt[3]{4}$
- d)
- $\sqrt[3]{\frac{1}{4}}$

(3) If $x + y = 7$ then $x(x + y) + y(x + y) = \dots\dots\dots$

- a) 7 b) 14 c) 49 d) 343

[B] Factorize each of the following perfectly:

① $2x^2 + 5x + 2$

② $\frac{1}{4}x^2 + 2$

[2] [A] Choose the correct answer:

(1) $]1, 4[\cap \{4\} = \dots\dots\dots$

- a)
- $\{1\}$
- b)
- $\{4\}$
- c)
- $\{1, 2, 3\}$
- d)
- $\emptyset$

(2) If $a < \sqrt[3]{30} < a + 1$, where $a \in \mathbb{Z}$, then $a = \dots\dots\dots$

- a) 2 b) 3 c) 4 d) 5

(3) The number of sides of the convex polygon whose sum of its interior angles measures is 1440° is $\dots\dots\dots$ sides

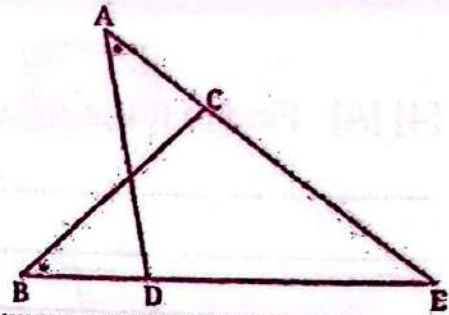
- a) 7 b) 8 c) 9 d) 10



[B] In the opposite figure

$$m(\angle A) = m(\angle B), \overline{AD} \cong \overline{BC}$$

Prove that : $AE = BE$



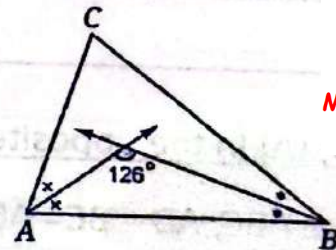
[3] [A] Choose the correct answer:

(1) In $\triangle ABC$, $m(\angle B) = 90^\circ$, $BC = 5$ cm, $AB = 12$ cm, then area of $\triangle ABC$ equals cm^2

- a) 15 b) 30 c) 60 d) 120

(2) In the opposite figure

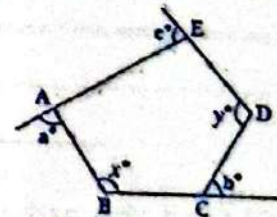
$$M(\angle C) = \dots\dots\dots^\circ$$



- a) 126 b) 108 c) 72 d) 54

(3) In the opposite figure

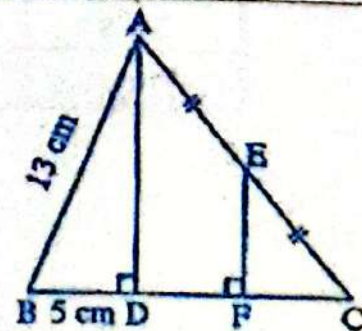
$$x + y = 230^\circ, \text{ then } a + b + c = \dots\dots\dots^\circ$$



- a) 310 b) 270 c) 230 d) 250

[B] In the opposite figure

Find: the length of $\overline{EF}$



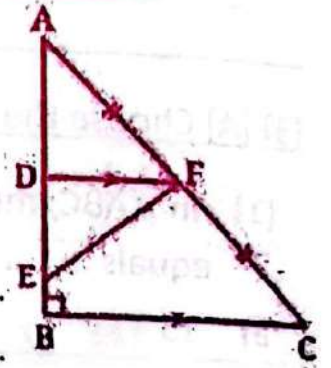
Mr Ahmed Mosaad
01004158925

[4] [A] Find in R the S.S of the equation: $x^2 - 3x = 0$

[B] In the opposite figure

$AB = BC = 16 \text{ cm.}$, $BE = 2 \text{ cm.}$

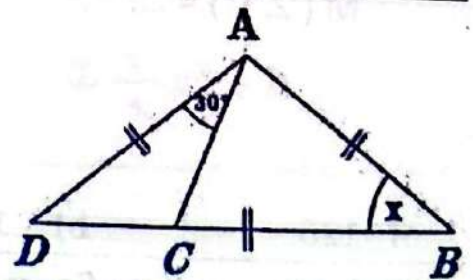
Find with proof: the length of $\overline{FE}$



[5] [A] In the opposite figure

In $\triangle ABC$, $AD = BC = AB$, $m(\angle DAC) = 30^\circ$

Find with proof: $m(\angle B)$



[B] Find the arithmetic mean for the following frequency distribution.

Sets	0 -	2 -	4 -	6 -	8 -	Sum
Frequency	11	10	12	8	9	50

End of the questions

م/أ حمد حسود

01004158925



FIRST SEMESTER

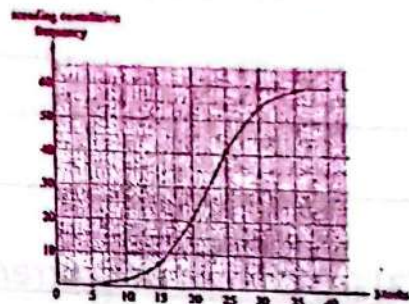
30



Mr Ahmed Mosaad
01004158925

[1] [A] Choose the correct answer:

- (1) The given diagram represents the ascending cumulative frequency curve for the marks of 60 students in a mathematics test.



What is the number of students who got less than 20 marks?

- a) 15 b) 21 c) 20 d) 7

- (2) The irrational number of the following is

- a) 0.3 b) $\sqrt{\frac{9}{25}}$ c) $-\sqrt{5}$ d) $\sqrt[3]{-125}$

- (3) $2\sqrt{7} - 3\sqrt{3} + \sqrt{7} + 2\sqrt{3} = \dots\dots\dots$

- a) $\sqrt{7} - 5\sqrt{3}$ b) $3\sqrt{7} + 5\sqrt{3}$ c) $3\sqrt{7} + \sqrt{3}$ d) $3\sqrt{7} - \sqrt{3}$

[B] If $A =]-1, 3]$, $B = [0, 5[$

Find: ① $A \cap B$ ② $A \cup B$

[2] [A] Choose the correct answer:

- (1) If the trinomial $16y^2 + ky + 1$ is a perfect square then $k = \dots\dots\dots$

- a) -8 b) 9 c) ± 8 d) ± 4

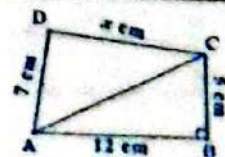
- (2) If $a\sqrt[3]{5} = \sqrt[3]{40}$, then $a = \dots\dots\dots$

- a) 8 b) 2 c) 5 d) 40

- (3) In the opposite figure

If $\overline{AB} \perp \overline{CB}$, $AB = 12$ cm, $BC = 5$ cm, $AD = 7$ cm

$DC = x$ cm, then $x \in \dots\dots\dots$

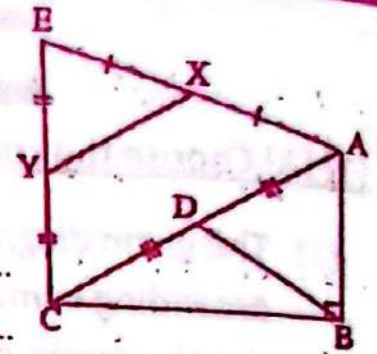


- a) $[6, 13[$ b) $]6, 20[$ c) $[13, 20]$ d) $[6, 20]$

[B] In the opposite figure

X, Y, D are midpoints of $\overline{AE}$, $\overline{EC}$, $\overline{AC}$ respectively

$m(\angle ABC) = 90^\circ$, Prove that: $BD = XY$



[3] [A] Choose the correct answer:

(1) $(x + 1)$ is a factor of the trinomial $(5x^2 - 2x - 7)$, then the other factor is

- a) $7x - 5$ b) $7x + 5$ c) $5x + 7$ d) $5x - 7$

(2) The center of the first set in the sets: 5-, 15-, 25-, 35- is

- a) 5 b) 10 c) 15 d) 20

(3) Number of medians of right-angled triangle is

- a) 310 b) 270 c) 230 d) 250

[B] Factorize each of the following perfectly:

① $x^2 + 7x + 12$

② $3x^3 + 24$

③ $7x - 28 + ax - 4a$



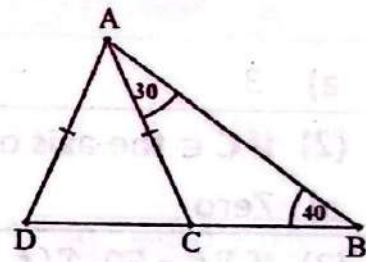
[4] [A] A cuboid of dimensions $2\sqrt{2}$ cm, 7 cm, $5\sqrt{2}$ cm, find its total surface area.

[B] In the opposite figure

$AD = AC$, $m(\angle B) = 40^\circ$, $m(\angle BAC) = 30^\circ$

Find with proof:

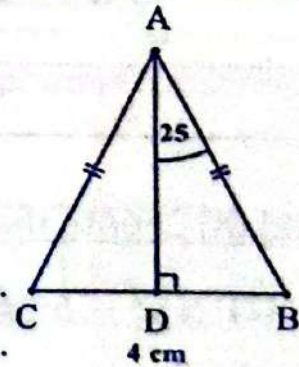
① $m(\angle D)$ ② $m(\angle CAD)$



[5] [A] In the opposite figure

In $\triangle ABC$, $AB = AC$, $m(\angle BAC) = 25^\circ$, $BC = 4$ cm

Find with proof: $m(\angle B)$



[B] Find the arithmetic mean for the following frequency distribution.

Sets	5 -	15 -	25 -	35 -	45 -	Sum
Frequency	4	5	6	3	2	20

End of the questions

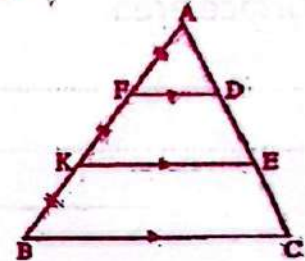


Prep 2 - Model No

12

[1] [A] Choose the correct answer:

(1) In the opposite figure

AC = 12 cm, then length of $\overline{AE}$ is cm.

- a) 3 b) 4 c) 6 d) 8

(2) If C $\in$ the axis of symmetry of $\overline{AB}$, then AC - BC =

- a) Zero b) 1 c) 2 d) 4

(3) If $\Sigma f = 50$, $\Sigma(f \cdot x_m) = 800$, then $\bar{x} = \dots\dots\dots$

- a) 16 b) 160 c) 750 d) 850

[B] Find an R the solution set of the following equations:

① $x^2 - 11 = 5$

② $x^2 - 15 = 2x$

[2] [A] Choose the correct answer:

(1) If $a^2 - b^2 = 45$, $a - b = 5$, then the value of $\sqrt{a + b} = \dots\dots\dots$

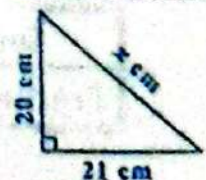
- a) 9 b) 3 c) -3 d) ± 3

(2) If $(x^3 + 27) = (x + 3)(x^2 + k + 9)$, then $k = \dots\dots\dots$

- a) $-6x$ b) $-3x$ c) $3x$ d) $6x$

(3) In the opposite figure

The value of x is



- a) 41 b) 27 c) $\sqrt{41}$ d) $\sqrt{29}$



[B] From the opposite stem leaf diagram

Make ascending frequency table

And represent it graphically

Stem	Leaf
1	4 5 5 7 8 9
2	5 7 8 9 9
3	1 2 2 2 4 5
4	6 7 8
5	0 1 2 3

Key 3 | 2 means 32

[3] [A] Choose the correct answer:

(1) Half the number 2^{14} is

- a) 2^{12} b) 2^{13} c) 4^8 d) 4^{12}

(2) If $x \in [-3, 4]$, then $x^2 \in$

- a) $[9, 16]$ b) $[0, 9]$ c) $[0, 16]$ d) $[-9, 0]$

(3) If $x + 2y = 7$, then the value of $2x + 4y$ is

- a) 14 b) 18 c) 28 d) 56

[B] The following frequency table represents the fees in pounds for some employees in a factory

Sets of fees	500-	600-	700-	800-	900-	Sum
Number of employees	8	K	18	7	5	50

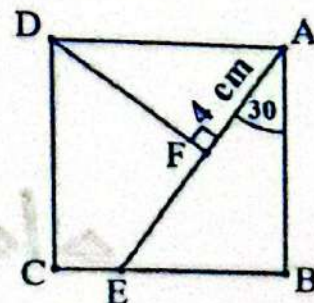
Find the value of k and the mode

[4] [A] In the opposite figure

ABCD is a square, $\overline{DF} \perp \overline{AE}$, $m(\angle BAE) = 30^\circ$,

$AF = 4$ cm,

Find: ① The length of $\overline{DF}$ ② Area of square

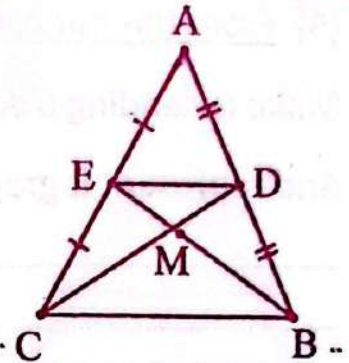


[B] In the opposite figure

E, D are midpoints of $\overline{AC}$, $\overline{AB}$ respectively

ED = 4 cm, MD = 3 cm

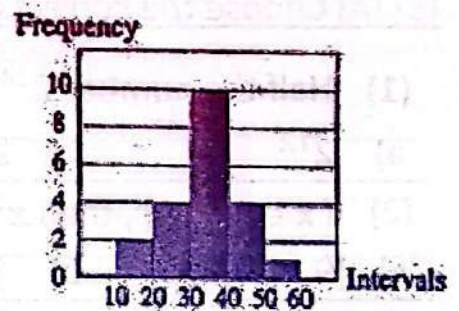
Find with proof: the perimeter of $\triangle BMC$



[5]

[A] From the given histogram

Form the sets frequency table, and Ascending frequency table and represent It graphically

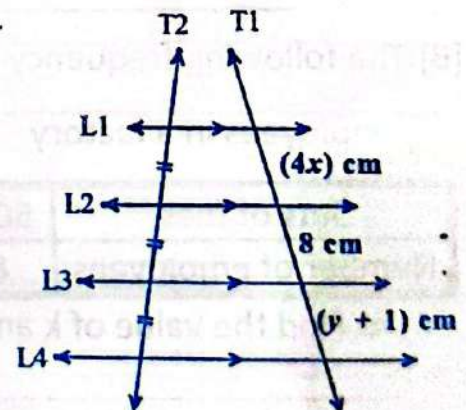


[B] In the opposite figure

$L_1 \parallel L_2 \parallel L_3 \parallel L_4$ and T_1 ,

T_2 intersect them

Find: The value of X,Y



End of the questions □



Mr Ahmed Mosaad
01004158925

أحمد مosaad
01004158925

حمل الآن

مجاناً وحصرياً

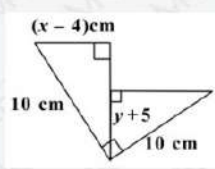
امتحانات رقم (4)

الترم الاول



Model (1)

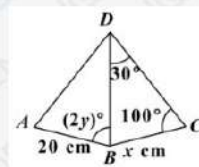
Question 1 : Choose the correct answer :

- ① Estimating $\sqrt[3]{25}$ to the closest integer is
 (a) 2 (b) 3 (c) 5 (d) 12.5
 - ② In the given figure : What is the value of $x-y$?
 (a) 9 (b) 6 (c) 5 (d) 1
- 
- ③ Which of the following numbers can be the lengths of the sides of a right-angled triangle ?
 (a) 7,7,4 (b) 12,5,13 (c) 5,8,7 (d) 3,7,5
 - ④ $x^2 - ax + bx - ab = \dots$
 (a) $(x-a)(x-b)$ (b) $(x-a)(x+b)$
 (c) $(x+a)(x-b)$ (d) $(x+a)(x+b)$
 - ⑤ If $a x^3 - 27 = (2x - 3)(4x^2 + bx + 9)$, what is the value of ab ?
 (a) 6 (b) 12 (c) 24 (d) 48
 - ⑥ If $x + \sqrt{28} = \sqrt{7}$, what is the value of x ?
 (a) $\sqrt{21}$ (b) $-\sqrt{21}$ (c) $\sqrt{7}$ (d) $-\sqrt{7}$
 - ⑦ What is the center of the second interval of the intervals : $5 - , 15 - , 25 - , 35 -$?
 (a) 5 (b) 10 (c) 15 (d) 20
 - ⑧ What is the sum of the measures of the interior angles of the convex hexagon ?
 (a) 900° (b) 720° (c) 540° (d) 360°
 - ⑨ If $2^x = 3$, what is the value of 2^{x+1} ?
 (a) 4 (b) 5 (c) 6 (d) 9

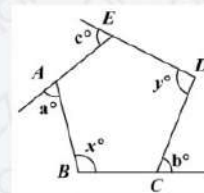
Question 2 : Answer the following questions :

- ① If $x = \sqrt{5} - 2$, $y = \sqrt{5} + 2$, find in its simplest form the value of the expression $x^2 - y^2$

- 2 In the given figure :
 $\triangle BCD$ is the image of $\triangle BAD$
 By reflection in DB , find the value of each of : x and y



- 3 In the given figure : $x + y = 230$
 Find with proof the value of : $a + b + c$



- 4 Find the solution set in $\mathbb{R}$: $(2x - 1)^2 + (2x - 1) = 6$

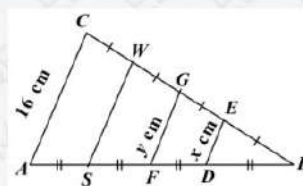
- 5 If $A = [-1, 3]$, $B =]-\infty, 3[$, find

- 1) $A - B$ 2) $A \cup B$ 3) $B \setminus A$

- 6 The given table shows the masses of 20 boxes in kilogram :
 Form an ascending cumulative frequency table and represent it graphically .

intervals	Frequency
45-	2
50-	3
55-	3
60-	6
65-	4
70-	2

- 7 Find the value of each of x and y :



Question 1 : Choose the correct answer :

① What is the multiplicative inverse of the number $-\sqrt{2}$ in its simplest form ?

- (a) $\sqrt{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\frac{\sqrt{2}}{2}$ (d) $-\frac{\sqrt{2}}{2}$

② What is the result of $\sqrt[3]{2} - 2\sqrt[3]{\frac{1}{4}}$?

- (a) 0 (b) 1 (c) $\sqrt[3]{2}$ (d) 2

③ If $x^3 + y^3 = 20, x^2 - xy + y^2 = 4$, what is the value of $2x + 2y$?

- (a) 5 (b) 10 (c) 15 (d) 20

④ What is the solution set of the equation $x^2 - 4x + 3 = 0$ in $\mathbb{R}$?

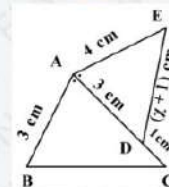
- (a) $\{1, 3\}$ (b) $\{-1, -3\}$ (c) $\{1, -3\}$ (d) $\{-1, 3\}$

⑤ If $a + b = 2\sqrt{5}, c - d = \sqrt{5}$, what is the value of $c - a + b + c - bd$?

- (a) $\sqrt{5}$ (b) $3\sqrt{5}$ (c) 10 (d) 20

⑥ In the given figure : what is the value of x ?

- (a) 1 (b) 2
(c) 3 (d) 4



⑦ What is the number of sides of a polygon whose sum of measures of its interior angles is 1980° ?

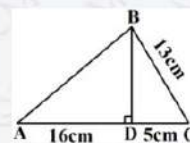
- (a) 10 (b) 11 (c) 12 (d) 13

⑧ If the lower limit of an interval is 15 and its center is 17.5, what is the length of the interval ?

- (a) 5 (b) 10 (c) 20 (d) 25

⑨ In the given figure : what is the length of AB ?

- (a) 12cm (b) 25cm
(c) 20cm (d) 16cm

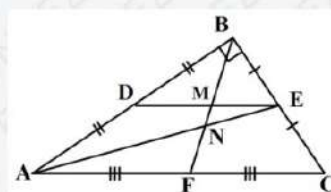


Question 2 : Answer the following questions :

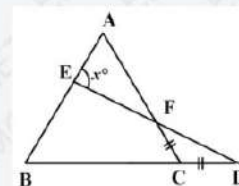
- ① If $x =]-4, 1]$, $y = [-2, 5[$, find the following in the form of an interval using the number line :
- 1) $x \cap y$
 - 2) $x \cup y$
 - 3) $x - y$

- ② Simplify the expression $\frac{(\sqrt{3})^{2n+3}}{(\sqrt{2})^{1-n} \times (\sqrt{6})^{n-1}}$ to its simplest form, then find the value of the result when $n=0$

- ③ In the given figure :
- If the length of $DE = 6$ cm ,
- Find with proof : the length of MN

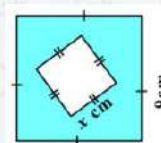


- ④ In the given figure :
- ABC is an equilateral triangle ,
- $AC \cap ED = \{F\}$, $CF = CD$
- Find with proof : the value of x



- ⑤ Factorize each of the following :
- 1) $4x^2 - 25$
 - 2) $b^3 - 8$
 - 3) $4x^2 + 14x - 30$

- ⑥ Express the area of the coloured part in the given figure as a product two factors .

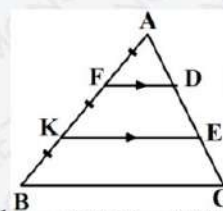


- ⑦ Find the arithmetic mean of the following frequency distribution :

Intervals	5-	15-	25-	35-	Total
frequency	6	8	k	2	20

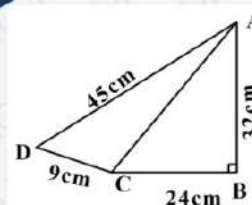
Question 1 : Choose the correct answer :

- ① What is the result of $5^2 + 5^2$?
 (a) 10^2 (b) 10^4 (c) 5^4 (d) 50
- ② $X^2 - aX + bX - ab = \dots\dots\dots$
 (a) $(X - a)(X - b)$ (b) $(X - a)(X + b)$
 (c) $(X + a)(X - b)$ (d) $(X + a)(X + b)$
- ③ $Xy + 5X + 7y + 35 = (X + a)(y + b)$, what is the value of $a - b$?
 (a) 2 (b) -2 (c) 12 (d) -12
- ④ In the given figure: If $AC = 12$ cm, what is the length of $\overline{AE}$?
 (a) 3 cm (b) 4 cm
 (c) 6 cm (d) 8 cm
- ⑤ If C belongs to the axis of symmetry of $\overline{AB}$, then what is the value of $AC - BC$?
 (a) Zero (b) 1 (c) 2 (d) 4
- ⑥ If the upper limit of an interval is 18 and its center is 15.5, what is the lower limit of this interval?
 (a) 12 (b) 12.5 (c) 13 (d) 13.5
- ⑦ If $\sum f = 50$, $\sum (f \cdot x_m) = 800$, what is the arithmetic mean $\bar{X}$?
 (a) 16 (b) 160 (c) 750 (d) 850
- ⑧ If $\triangle ABC \cong \triangle LMN$, $m(\angle C) = 90^\circ$, then $m(\angle L) + m(\angle M) = \dots\dots\dots$
 (a) 45° (b) 90° (c) 180° (d) 120°
- ⑨ $5 + 7\sqrt{2} - 4 + \sqrt{2} = \dots\dots\dots$
 (a) 15 (b) $1 + 7\sqrt{2}$ (c) $1 + 8\sqrt{2}$ (d) $1 + 6\sqrt{2}$



Question 2 : Answer the following questions :

- ① In the given figure : ABCD is a quadrilateral where $m(\angle B) = 90^\circ$, $AB = 32$ cm, $BC = 24$ cm, $CD = 9$ cm, $AD = 45$ cm Prove that: $\triangle ACD$ is an obtuse angled triangle.



2 If $a = \sqrt{3} + \sqrt{2}$, $b = \frac{1}{\sqrt{3} + \sqrt{2}}$ find the value of the expression in the simplest form: $\frac{(a-b)^2}{ab}$

3 Simplify to the simplest form :- $\frac{(\sqrt{5})^n \times (\sqrt{3})^{2-n}}{3 \times (\sqrt{15})^{-n}}$, then find the numerical value of the result when $n = -2$

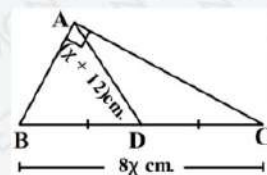
4 Factorize each of the following completely:

- 1) $X^2 + X - 42$
- 2) $25 - 9X^2$
- 3) $14a(X + y) - 21b(X + y)$

5 The given table shows the frequency distribution of marks of 60 students in the mathematics test: Find the value of k, then draw the ascending cumulative frequency curve, and estimate the median.

Marks	Frequency
5-	2
10-	5
15-	14
20-	20
25-	K
30-	5
35-	1
Total	60

6 In the given figure : $\triangle ABC$ is right-angled at A, $\overline{AD}$ is its median. Find: The length of $\overline{AD}$.



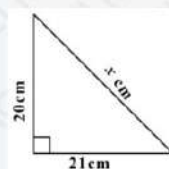
7 Find using the number line:

- 1) $[2, 7] - [3, 8]$
- 2) $]3, \infty[\cap]-\infty, 7[$
- 3) $] - \infty, 3[\cap]$

Model (4)

Question 1 : Choose the correct answer :

- 1 What is the number of medians in an obtuse-angled triangle ?
 (a) 0 (b) 1 (c) 2 (d) 3
- 2 Which of the following represents the factorization of the polynomial $5X - 6 - X^2$?
 (a) $(X-2)(X-3)$ (b) $(X+2)(X+3)$
 (c) $-(X+2)(X+3)$ (d) $-(X-2)(X-3)$
- 3 If $X^3 + 27 = (X + 3)(X^2 + k + 9)$, what is the value of k?
 (a) $-6x$ (b) $-3x$ (c) $3x$ (d) $6x$
- 4 In the given figure : What is the value of X?
 (a) 41 (b) 29
 (c) $\sqrt{41}$ (d) $\sqrt{29}$
- 5 The set of non-negative real numbers is
 (a) $]0, \infty[$ (b) $]-\infty, 0[$ (c) $[0, \infty[$ (d) $]-\infty, 0]$
- 6 $6a - 8b = \dots\dots\dots$
 (a) $6(a - 2b)$ (b) $4(2a - 4b)$ (c) $2(3a - 4b)$ (d) $14(a - b)$
- 7 When completing the square for $(X^2 + 9)$, we add
 (a) $\pm x$ (b) $\pm 6x$ (c) $\pm 9x$ (d) ± 12
- 8 If $X^2 - a = (X - 4)(X + 4)$, what is the value of a?
 (a) -16 (b) 16 (c) -8 (d) 8
- 9 In $\triangle ABC$, if $m(\angle A) = m(\angle B) \neq 60^\circ$, what is the number of its axes of symmetry?
 (a) 0 (b) 1 (c) 2 (d) 3



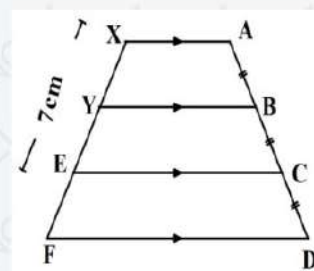
Question 2 : Answer the following questions :

- 1 Simplify to its simplest form : $\frac{(10)^{2n} \times 0.001}{(10)^{-n+1} \times 100}$,
 then find the value of the result when $n = 2$.

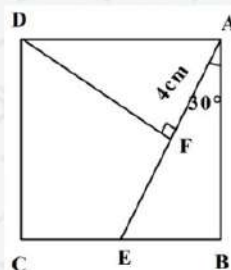
- 2 [a] : Use factorizing to facilitate the calculation of the value of each of the following:
- 1) $(8.27)^2 - (1.73)^2$
 - 2) $(101)^2 - 2 \times 101 + 1$
- [b] Factorize each of the following completely:
- 1) $(X - y)^2 + 4 X y$
 - 2) $X^4 + 8 X$

- 3 Determine the type of the triangle based on its angles if the lengths of its sides are 6 cm, 5 cm, 7 cm.

- 4 In the given figure: Find with proof: The length of $\overline{XF}$



- 5 In the given figure :
ABCD is a square, $AF = 4$ cm,
 $\overline{DF} \perp \overline{AE}$, $m(\angle BAE) = 30^\circ$
Find: 1) The length of $\overline{DF}$
2) The area of the square ABCD



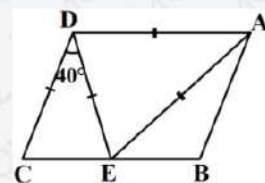
- 6 The following frequency table shows the frequency distribution of the number of vacation days for 50 workers:

Marks	2-	6-	10-	14-	18-	22-	26-
Frequency	4	5	8	$K - 2$	7	5	1

- 1) Find the value of k
- 2) Form the ascending cumulative frequency table and represent it graphically.

3) What is the percentage of workers whose vacations are less than 10 days? **18%**

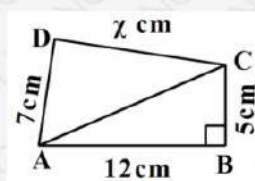
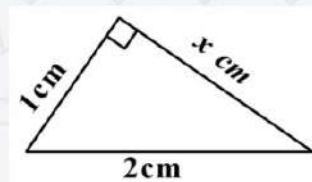
- 7 In the given figure: ABCD is a parallelogram , $E \in \overline{BC}$
where $AE = AD$, $DE = DC$, $m(\angle CDE) = 40^\circ$
Find: 1) $m(\angle AED)$
2) $m(\angle BAE)$



Model (5)

Question 1 : Choose the correct answer :

- 1 The centroid of the triangle divides each median in the ratio from the vertex.
(a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 2 : 3
- 2 In the given figure: What is the value of X?
(a) 1 (b) 3 (c) $\sqrt{5}$ (d) $\sqrt{3}$
- 3 Which of the following numbers is irrational ?
(a) $0.\bar{3}$ (b) $\sqrt{\frac{9}{25}}$ (c) $\sqrt{5}$ (d) $\sqrt[3]{-125}$
- 4 In the given figure: If $\overline{AB} \perp \overline{CB}$, $AB = 12$ cm ,
 $BC = 5$ cm , $AD = 7$ cm ,
 $DC = X$ cm , then $X \in \dots\dots\dots$
(a) $[6,13[$ (b) $]6,20[$ (c) $[13,20]$ (d) $[6,20]$
- 5 If the polynomial $(16X^2 - 40X + k^2)$ is a perfect square, what is the value of k?
(a) 5 (b) -5 (c) ± 5 (d) 8
- 6 $49a + 14b^2 = 7b$ (.....)
(a) $7b + 2a$ (b) $7a + 2b$ (c) $42a + 7b$ (d) $14ab$
- 7 What is the result of $[1,3] - \{1,3\}$?
(a) $]1,3[$ (b) $[1,3[$ (c) $] - 3, -1[$ (d) $] - 1,3[$

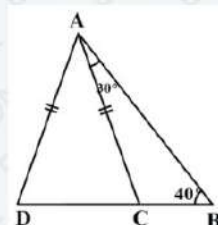


- 8 If $\triangle ABC \cong \triangle XYZ$, $m(\angle B) + m(\angle C) = 100^\circ$, then $m(\angle X) = \dots$
- (a) 40° (b) 50° (c) 80° (d) 100°
- 9 If $\sqrt[3]{40} = a\sqrt[3]{5}$, what is the value of a?
- (a) 8 (b) 2 (c) 5 (d) 40

Question 2 : Answer the following questions :

- 1 In the given figure : $AC = AD$, $m(\angle B) = 40^\circ$,
 $m(\angle BAC) = 30^\circ$ Find by proof:

- 1) $m(\angle D)$
2) $m(\angle CAD)$



- 2 Simplify to the simplest form: $\frac{7}{3}\sqrt{18} + \sqrt[3]{54} - 7\sqrt{2} + \sqrt[3]{16}$

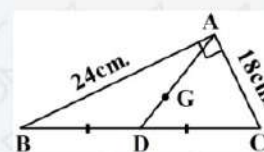
- 3 A rectangular prism with dimensions $2\sqrt{2}$ cm, 7 cm, $5\sqrt{2}$ cm. Calculate its total area and volume.

- 4 If the total area of a cube is 240 cm^2 , then find the length of its edge to the nearest centimeter?

- 5 Use factorizing to facilitate the calculation of each of the following:

- 1) $(999)^2 + 2 \times 999 + 1$
2) $(1.6)^2 - (1.4)^2$
3) $123 \times 14 + 123 \times 37 - 123$

- 6 In the given figure:
If G is the centroid of the triangle ABC,
 $\triangle ABC$ is right-angled at A
Find: The length of $\overline{AG}$

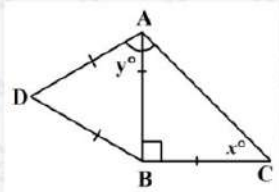
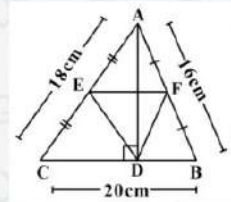


- 7 The following table shows the frequency distribution of wages in pounds for some workers in a factory:

Wage Intervals	500-	600-	700-	800-	900-	Totle
Number of Workers	8	K	18	7	5	50

Find the value of k, then estimate the mode.

Question 1 : Choose the correct answer :

- ① The number of medians of the right-angled triangle is
 (a) 0 (b) 1 (c) 2 (d) 3
 - ② In the given figure: $AD = DB = AB = BC$, $m(\angle ABC) = 90^\circ$ What is the value of $X + y$?
 (a) 45 (b) 60 (c) 120 (d) 150
- 
- ③ What is the center of the first interval in the intervals: 5-, 15-, 25-, 35-?
 (a) 5 (b) 10 (c) 15 (d) 20
 - ④ In the given figure: The perimeter of $\triangle FDE$ = cm
 (a) 37 (b) 54 (c) 18 (d) 27
- 
- ⑤ $(2\sqrt[3]{2})^3 =$
 (a) 4 (b) 8 (c) 16 (d) 40
 - ⑥ If $(X + 1)$ is one of the factors of the trinomial $(5X^2 - 2X - 7)$, what is the other factor?
 (a) $7x - 5$ (b) $7x + 5$ (c) $5x + 7$ (d) $5x - 7$
 - ⑦ If the polynomial $(X^2 + kX + 36)$ is a perfect square, what is the value of k ?
 (a) +6 (b) ± 8 (c) ± 12 (d) ± 18
 - ⑧ If $\triangle ABC$ has one axis of symmetry, $m(\angle ABC) = 140^\circ$, what is $m(\angle A)$?
 (a) 30° (b) 20° (c) 40° (d) 60°
 - ⑨ If $X + y = 6$, $X^2 - y^2 = 12$, what is the value of $X - y$?
 (a) 4 (b) 6 (c) 2 (d) -2

Question 2 : Answer the following questions :

- ① If $a = \sqrt[3]{5} + \sqrt[3]{2}$, $b = \sqrt[3]{5} - \sqrt[3]{2}$, find in the simplest form each of the following:
 1) $(a + b)^3$
 2) $a \times b$

2 Factorize each of the following completely:

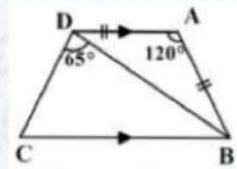
- 1) $6X^2 + 7X + 2$
- 2) $(a + b)^2 - 4$
- 3) $X^4 + 2X^3 - 9X^2 - 18X$

3 In the given figure:

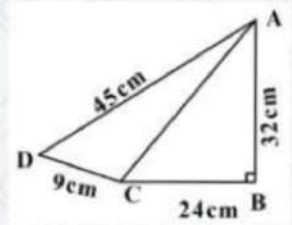
$AB = AD$, $\overline{DA} \parallel \overline{CB}$, $m(\angle BDC) = 65^\circ$, $m(\angle A) = 120^\circ$

Find: 1) $m(\angle ADB)$

2) $m(\angle C)$



4 In the given figure : ABCD is a quadrilateral where $m(\angle B) = 90^\circ$, $AB = 32$ cm, $BC = 24$ cm, $CD = 9$ cm, $AD = 45$ cm
Prove that: $\triangle ACD$ is an obtuse angled triangle.

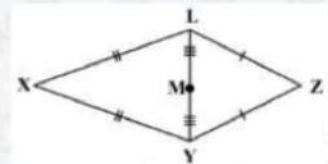


5 Simplify to the simplest form: $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

6 In the given figure:

$XL = XY$, $ZL = ZY$, $ML = MY$

Prove that: X, M and Z are collinear.

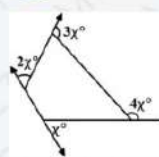


7 The following table shows the frequency distribution of marks of 40 students in one of the tests:

Intervals	5-	15-	25-	35-	45-	Total
Frequency	3	K	12	10	5	40

Find the value of k, then estimate the arithmetic mean.

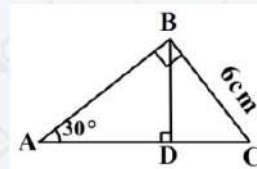
Question 1 : Choose the correct answer :

- 1 If $3^X = 2$, what is the value of 3^{X-1} ?
 (a) 1 (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) 6
- 2 $aX + ay - bX - by = \dots\dots\dots$
 (a) $(X - y)(a - b)$ (b) $(X + y)(a + b)$
 (c) $(X - y)(a + b)$ (d) $(X + y)(a - b)$
- 3 If the lower limit of an interval is 10 and the upper limit is X and its center is 15, what is the value of X?
 (a) 5 (b) 12.5 (c) 20 (d) 25
- 4 In the given figure: What is the value of X?
 (a) 360 (b) 40
 (c) 36 (d) 18
 
- 5 If the polynomial $(16y^2 + ky + 1)$ is a perfect square, what is the value of k?
 (a) -8 (b) 8 (c) ± 8 (d) ± 4
- 6 What is the convex polygon that has no diagonals?
 (a) The hexagon (b) The pentagon (c) The quadrilateral (d) The triangle
- 7 What is the estimate of the number $\sqrt[3]{36}$ to the nearest integer?
 (a) 3 (b) 4 (c) 5 (d) 6
- 8 What is the measure of the interior angle of a regular hexagon?
 (a) 60° (b) 108° (c) 120° (d) 135°
- 9 If $X^2 - a = (X-5)(X+5)$, what is the value of a?
 (a) -25 (b) 25 (c) -10 (d) 10

Question 2 : Answer the following questions :

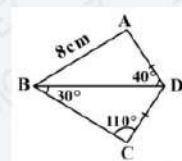
- 1 If $X = [-2, 1[$, $Y = [1, 4[$, find using the number line each of the following:
 1) $X \cap Y$
 2) $Y - X$

- 2 In the given figure:
ABC is a right-angled triangle at B, $m(\angle A) = 30^\circ$,
 $BC = 6 \text{ cm}$, $\overline{BD} \perp \overline{AC}$
Find: The length of $\overline{AD}$

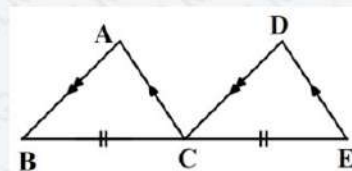


- 3 Find the solution set of each of the following two equations in R:
1) $16X^2 - 3 = 4x^2 + 7$
2) $X^2 - 6X = -8$

- 4 In the given figure:
 $AD = CD$, $m(\angle ADB) = 40^\circ$, $m(\angle C) = 110^\circ$
 $m(\angle DBC) = 30^\circ$, $AB = 8 \text{ cm}$
Find with proof: 1) The length of $\overline{BC}$
2) $m(\angle ABC)$



- 5 In the given figure:
 $\overline{AC} \parallel \overline{DE}$, $\overline{AB} \parallel \overline{DC}$, $\overline{BC} \cong \overline{CE}$
Prove that: $\triangle ABC \cong \triangle DCE$



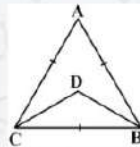
- 6 Find the solution set of each of the following equations in R:
1) $X^2 - 9x + 18 = 0$
2) $9X^2 + 5 = 24X$

- 7 The following table shows the frequency distribution of the marks of 100 students in one of the tests:

Intervals	10-	20-	30-	40-	50-	Total
Frequency	16	24	30	20	10	100

Estimate the value of the median.

Question 1 : Choose the correct answer :

- 1 If $\angle A$ complements $\angle B$ in the triangle ABC, then $(AC)^2 + (BC)^2 \dots\dots\dots (AB)^2$
 - (a) =
 - (b) <
 - (c) >
 - (d) $\neq$
- 2 If $(2X + 3y)$ is one of the factors of the trinomial $(6X^2 + 13Xy + 6y^2)$, what is the an other factor?
 - (a) $(6X + 6y)$
 - (b) $(2X + 3y)$
 - (c) $(3X + 2y)$
 - (d) $(X + 3y)$
- 3 If $3X - 3y = 27$, what is the value of $y - X$?
 - (a) 24
 - (b) 9
 - (c) -9
 - (d) 3
- 4 In the given figure: ABC is an equilateral triangle, $\angle C$ and $\angle B$ are bisected by two bisectors that meet at D, then $m(\angle BDC) = \dots\dots\dots$
 - (a) 60°
 - (b) 90°
 - (c) 108°
 - (d) 120°
- 5 If the polynomial $(kX^2 - 14X + 49)$ is a perfect square, what is the value of k?
 - (a) 49
 - (b) ± 7
 - (c) -1
 - (d) 1
- 6 If $\Sigma f = 30$, $\Sigma(f \cdot X) = 960$, what is the arithmetic mean $\bar{X}$?
 - (a) 32
 - (b) 320
 - (c) 930
 - (d) 990
- 7 If the projection of the point (25,40) which lies on the ascending cumulative frequency curve on the horizontal axis determines the median, what is the value of the median?
 - (a) 25
 - (b) 40
 - (c) 80
 - (d) 50
- 8 If $X + y = 2$, $X^2 - Xy + y^2 = 8$, what is the value of $X^3 + y^3$?
 - (a) 16
 - (b) 10
 - (c) 6
 - (d) 4
- 9 The set of non-positive real numbers is
 - (a) $] 0, \infty [$
 - (b) $] -\infty, 0 [$
 - (c) $[0, \infty [$
 - (d) $] -\infty, 0]$

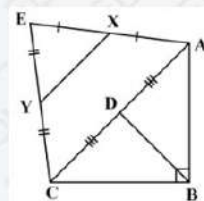
Question 2 : Answer the following questions :

①

In the given figure:

X, Y and D are the midpoints of $\overline{EA}$, $\overline{EC}$ and $\overline{AC}$ respectively,
 $m(\angle ABC) = 90^\circ$

Prove that: $BD = YX$



②

Factorize each of the following completely:

- 1) $X^2 + 7X + 12$
- 2) $3X^3 + 24$
- 3) $7X - 28 + aX - 4a$

③

[a] Find in the simplest form: $\sqrt[3]{54} + 4\sqrt[3]{\frac{1}{4}} - \sqrt[3]{2}$

[b] If $A =] -1, 3]$, $B = [0, 5 [$, find each of the following:

- 1) $A \cap B$
- 2) $B - A$

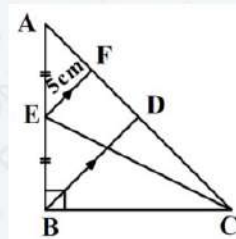
④

In the given figure:

If ABC is a right-angled triangle at B in which

$\overline{BD}$ and $\overline{CE}$ are two medians,
 $\overline{EF} \parallel \overline{BD}$, $EF = 5$ cm.

Find with proof: The length of $\overline{AC}$



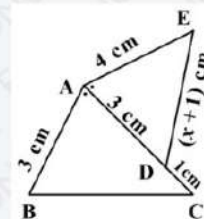
⑤

If $x = \sqrt{5} - \sqrt{3}$, $y = \frac{2}{\sqrt{5} - \sqrt{3}}$, what is the value of: $X^2 + y^2$?

⑥

In the given figure:

Prove that: $\triangle ABC \cong \triangle ADE$



⑦

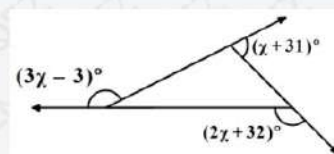
Using the following frequency distribution table:

Intervals	5-	15-	25-	35-	45-	Total
Frequency	7	9	12	K	4	40

- 1) Find the value of k
- 2) Estimate the median.

Question 1 : Choose the correct answer :

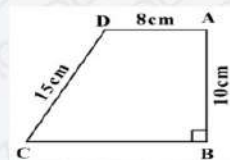
- ① $X^{m-1} \times \dots = 1, X \neq 0$
 (a) X^{m-1} (b) X^{-m-1} (c) X^{m+1} (d) X^{-m+1}
- ② If the polynomial $(9X^2 + 30X + k^2)$ is a perfect square, what is the value of k ?
 (a) -5 (b) 5 (c) ± 25 (d) ± 5
- ③ If $a^2 - b^2 = 16, a - b = 4$, what is the value of $\sqrt{a+b}$?
 (a) 2 (b) $+4$ (c) 8 (d) 16
- ④ In the given figure: What is the value of X ?
 (a) 50 (b) 20
 (c) 5 (d) 2
- ⑤ $\{3, 4, 5\} -]3, 5[= \dots$
 (a) $\emptyset$ (b) $\{3, 5\}$ (c) $\{4\}$ (d) $[3, 5]$
- ⑥ If $X \in [-3, 4]$, then $X^2 \in \dots$
 (a) $[9, 16]$ (b) $[0, 9]$ (c) $[0, 16]$ (d) $[-9, 0]$
- ⑦ If $a^2 + 2ab + b^2 = 36$, what is the value of $a + b$?
 (a) 6 (b) -6 (c) ± 6 (d) 18
- ⑧ When completing the square for $(X^2 + 36)$, we add
 (a) $\pm 3X$ (b) $\pm 6X$ (c) $\pm 9X$ (d) $\pm 12X$
- ⑨ If the point M is the centroid of the triangle ABC , $\overline{BD}$ is a median, then $BD : MD = \dots$
 (a) $2 : 3$ (b) $1 : 3$ (c) $3 : 2$ (d) $3 : 1$



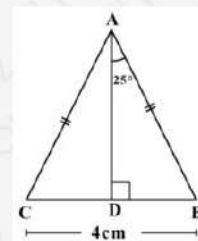
Question 2 : Answer the following questions :

- ① Factorize each of the following completely:
 1) $-x^2 + 3x + 40$
 2) $4m^4 + 1$
 3) $a(b+5) + 2(b+5)$

- 2 In the given figure:
ABCD is a trapezoid right-angled at B. $AD = 8\text{ cm}$,
 $DC = 15\text{ cm}$, $AB = 10\text{ cm}$
Find: The area of the trapezoid ABCD.

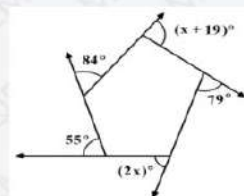


- 3 In the given figure:
In $\triangle ABC$, $AB = AC$, $\overline{AD} \perp \overline{BC}$,
 $m(\angle BAD) = 25^\circ$, $BC = 4\text{ cm}$



- Find : 1) $m(\angle DAC)$
2) The length of $\overline{DC}$

- 4 From the given figure:
Find: The value of X



- 5 [a] Simplify to the simplest form: $\frac{(\sqrt{6})^{n+2} \times (\sqrt{3})^n}{4 \times (\sqrt{2})^{n+2}}$
[b] Find the solution set in R of each of the following:
1) $2x^3 + 13 = 67$
2) $4x^2 + 1 = 4x$

- 7 Using the following frequency distribution table, find the mean value:

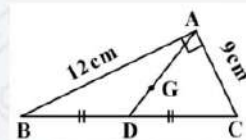
Intervals	5-	15-	25-	35-	45-	Total
Frequency	4	5	6	3	2	20

Model (10)

Question 1 : Choose the correct answer :

- 1 What is the multiplicative inverse of the number $\sqrt{5}$ in its simplest form?
- (a) -5 (b) $-\frac{1}{5}$ (c) $\frac{5}{\sqrt{5}}$ (d) $\frac{\sqrt{5}}{5}$

- 2 If the upper limit of an interval is 18 and its center is 15, what is the lower limit of this interval ?
 (a) 12 (b) 12.5 (c) 13 (d) 13.5
- 3 If $X^2 - y^2 = 20$, $X + y = 10$, what is the value of $y - X$?
 (a) 10 (b) 2 (c) -2 (d) -10
- 4 In the given figure: If G is the centroid of $\triangle ABC$, $\triangle ABC$ is right-angled at A, then the length of $\overline{AG} = \dots\dots\dots$ cm
 (a) 15 (b) 7.5
 (c) 5 (d) 2.5
- 5 If $X + b = 3$, $X^2 + a = 4$, what is the numerical value of the polynomial $X^3 + bX^2 + aX + ab$?
 (a) 1 (b) 7 (c) 12 (d) 36
- 6 If the lengths of two sides in an isosceles triangle are 3 cm and 4 cm, then its largest angle is
 (a) acute (b) Right (c) Obtuse (d) straight
- 7 If $X + 2y = 7$, what is the value of $2X + 4y$?
 (a) 14 (b) 18 (c) 28 (d) 56
- 8 What is the half of the number 2^{14} ?
 (a) 2^{12} (b) 2^{13} (c) 4^8 (d) 2^{12}
- 9 If $X = \frac{\sqrt{9}}{\sqrt{3}}$, what is the value of X^{-1} ?
 (a) $\frac{\sqrt{3}}{3}$ (b) $\frac{\sqrt{9}}{\sqrt{2}}$ (c) $\sqrt{3}$ (d) 2

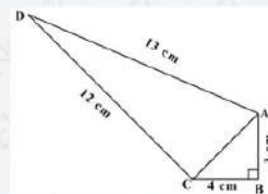


Question 2 : Answer the following questions :

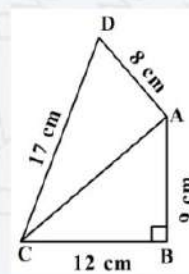
- 1 If $a = \sqrt{3} + \sqrt{2}$, $b = \frac{1}{\sqrt{3} + \sqrt{2}}$
 Find in the simplest form the value of: $(a - b)^2$
- 2 Find in R the solution set of each of the following equations:
 1) $x^2 - 11 = 5$
 2) $x^2 - 15 = 2x$

- 3 The dimensions of a rectangle are $(6 + \sqrt{5})$ cm and $(6 - \sqrt{5})$ cm, calculate its area.

- 4 In the given figure:
ABCD is a quadrilateral where $m(\angle B) = 90^\circ$,
 $AB = 3$ cm, $BC = 4$ cm, $AD = 13$ cm, $CD = 12$ cm
Prove that: $m(\angle ACD) = 90^\circ$



- 5 In the given figure:
ABCD is a quadrilateral where: $m(\angle B) = 90^\circ$,
 $AB = 9$ cm, $BC = 12$ cm, $CD = 17$ cm, $AD = 8$ cm.
Prove that: $m(\angle DAC) = 90^\circ$
Then find: The area of the figure ABCD.



- 6 Simplify each of the following to the simplest form:

1) $\sqrt{5} - \sqrt{3} + 2\sqrt{5} + \sqrt{3}$

2) $\frac{x^2 \times x^{-3}}{x^{-4} \times x}$

- 7 The following table shows the frequency distribution of marks for 40 students in one of the tests:

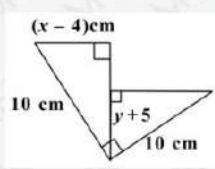
Intervals	5-	15-	...	35-	45-	Total
Number of students	3		12	10	5	40

- Complete the table.
- Estimate the arithmetic mean.
- Find the number of students whose marks are not less than 35

Model (1)

Question 1 : Choose the correct answer :

- 1 Estimating $\sqrt[3]{25}$ to the closest integer is
 (a) 2 (b) **3** (c) 5 (d) 12.5
- 2 In the given figure : What is the value of x-y ?
 (a) **9** (b) 6 (c) 5 (d) 1


- 3 Which of the following numbers can be the lengths of the sides of a right-angled triangle ?
 (a) 7,7,4 (b) **12,5,13** (c) 5,8,7 (d) 3,7,5
- 4 $x^2 - ax + bx - ab = \dots$
 (a) $(x-a)(x-b)$ (b) **$(x-a)(x+b)$**
 (c) $(x+a)(x-b)$ (d) $(x+a)(x+b)$
- 5 If $ax^3 - 27 = (2x-3)(4x^2 + bx + 9)$, what is the value of ab ?
 (a) 6 (b) 12 (c) 24 (d) **48**
- 6 If $x + \sqrt{28} = \sqrt{7}$, what is the value of x ?
 (a) $\sqrt{21}$ (b) $-\sqrt{21}$ (c) $\sqrt{7}$ (d) **$-\sqrt{7}$**
- 7 What is the center of the second interval of the intervals : 5 - , 15 - , 25 - , 35 - ?
 (a) 5 (b) 10 (c) 15 (d) **20**
- 8 What is the sum of the measures of the interior angles of the convex hexagon ?
 (a) 900° (b) **720°** (c) 540° (d) 360°
- 9 If $2^x = 3$, what is the value of 2^{x+1} ?
 (a) 4 (b) 5 (c) **6** (d) 9

Question 2 : Answer the following questions :

- 1 If $x = \sqrt{5} - 2$, $y = \sqrt{5} + 2$, find in its simplest form the value of the expression $x^2 - y^2$
Ans : $x^2 - y^2 = (x+y)(x-y)$
 $= (\sqrt{5} - 2 + \sqrt{5} + 2)(\sqrt{5} - 2 - \sqrt{5} - 2)$

$$= 2\sqrt{5} \times (-4)$$

$$= -8\sqrt{5}$$

2

In the given figure :

$\triangle BCD$ is the image of $\triangle BAD$

By reflection in DB , find the value of each of : x and y

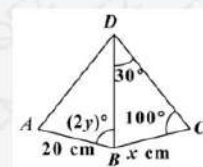
Ans: $\because \triangle BCD \cong \triangle BAD$

$$\therefore AB = BC$$

$$\therefore x = 20\text{cm}$$

$$m(\angle CBD) = 180^\circ - (100^\circ + 30^\circ) = 50^\circ$$

$$\therefore y = 50 \quad \therefore y = 25$$



3

In the given figure : $x + y = 230$

Find with proof the value of : $a + b + c$

Ans :

$$\therefore m(\angle BAE) = 180^\circ - a^\circ,$$

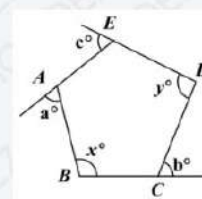
$$m(\angle BCD) = 180^\circ - b^\circ$$

$$\therefore m(\angle AED) = 180^\circ - c^\circ$$

$$\therefore \text{the sum of the measure of the interior angles of the pentagon} = 540^\circ = (5 - 2) \times 180^\circ$$

$$\therefore x + y + (180 - a) + (180 - b) + (180 - c) = 540^\circ$$

$$\therefore a + b + c = 230$$



4

Find the solution set in R : $(2x - 1)^2 + (2x - 1) = 6$

Ans:

$$(2x - 1)^2 + (2x - 1) = 6$$

$$\therefore 4x^2 - 4x + 1 + 2x - 1 - 6 = 0$$

$$4x^2 - 2x - 6 = 0$$

$$2(2x^2 - x - 3) = 0$$

$$(2x - 3)(x + 1) = 0$$

$$\therefore \text{the solution set} = \left\{ \frac{3}{2}, -1 \right\}$$

5 If $A = [-1, 3]$, $B =]-\infty, 3[$, find

- 2) $A - B$ 2) $A \cup B$ 3) $B \setminus$

Ans:

2) $\{3\}$

3) $] - \infty, 3[$

4) $[3, \infty[$

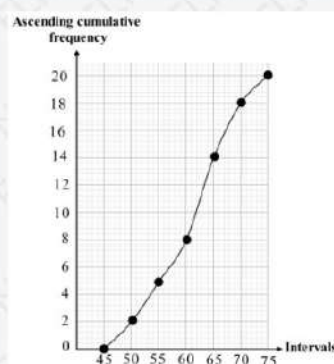
6 The given table shows the masses of 20 boxes in kilogram :

Form an ascending cumulative frequency table and represent it graphically .

Ans :

Upper limits of intervals	Ascending cumulative frequency
Less than 45	0
Less than 50	2
Less than 55	5
Less than 60	8
Less than 65	14
Less than 70	18
Less than 75	20

intervals	Frequency
45-	2
50-	3
55-	3
60-	6
65-	4
70-	2



7 Find the value of each of x and y :

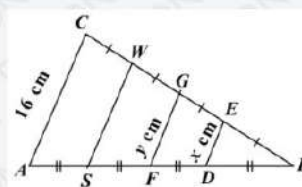
Ans :

$$FG = \frac{1}{2} AC = 8 \text{ cm}$$

$$\therefore y = 8$$

$$DE = \frac{1}{2} FG = 4 \text{ cm}$$

$$\therefore x = 4$$



Question 1 : Choose the correct answer :

① What is the multiplicative inverse of the number $-\sqrt{2}$ in its simplest form ?

- (a) $\sqrt{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\frac{\sqrt{2}}{2}$ (d) $-\frac{\sqrt{2}}{2}$

② What is the result of $\sqrt[3]{2} - 2\sqrt[3]{\frac{1}{4}}$?

- (a) 0 (b) 1 (c) $\sqrt[3]{2}$ (d) 2

③ If $x^3 + y^3 = 20$, $x^2 - xy + y^2 = 4$, what is the value of $2x + 2y$?

- (a) 5 (b) 10 (c) 15 (d) 20

④ What is the solution set of the equation $x^2 - 4x + 3 = 0$ in $\mathbb{R}$?

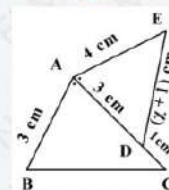
- (a) {1,3} (b) {-1,-3} (c) {1,-3} (d) {-1,3}

⑤ If $a + b = 2\sqrt{5}$, $c - d = \sqrt{5}$, what is the value of $c - a + b + c - bd$?

- (a) $\sqrt{5}$ (b) $3\sqrt{5}$ (c) 10 (d) 20

⑥ In the given figure : what is the value of x ?

- (a) 1 (b) 2
(c) 3 (d) 4



⑦ What is the number of sides of a polygon whose sum of measures of its interior angles is 1980° ?

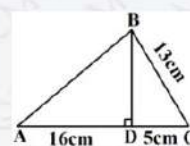
- (a) 10 (b) 11 (c) 12 (d) 13

⑧ If the lower limit of an interval is 15 and its center is 17.5, what is the length of the interval ?

- (a) 5 (b) 10 (c) 20 (d) 25

⑨ In the given figure : what is the length of AB ?

- (a) 12cm (b) 25cm
(c) 20cm (d) 16cm



Question 2 : Answer the following questions :

- ① If $x =]-4, 1]$, $y = [-2, 5[$, find the following in the form of an interval using the number line :
- 1) $x \cap y$ **$[-2, 1]$**
 - 2) $x \cup y$ **$]-4, 5[$**
 - 3) $x - y$ **$]-2, 4[$**

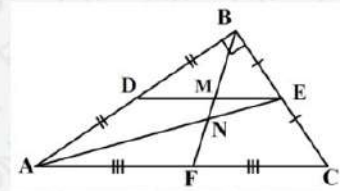
- ② Simplify the expression $\frac{(\sqrt{3})^{2n+3}}{(\sqrt{2})^{1-n} \times (\sqrt{6})^{n-1}}$ to its simplest form, then find the value of the result when $n=0$

$$(\sqrt{3})^{n+4} = (\sqrt{3})^4 = 9$$

- ③ In the given figure :

If the length of $DE = 6$ cm,

Find with proof : the length of $MN = 1$ cm

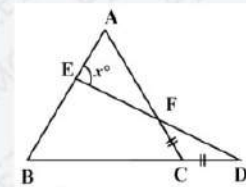


- ④ In the given figure :

ABC is an equilateral triangle,

$AC \cap ED = \{F\}$, $CF = CD$

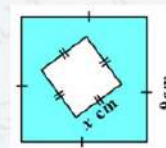
Find with proof : the value of $x = 90$



- ⑤ Factorize each of the following :

- 1) $4x^2 - 25 = (2x + 5)(2x - 5)$
- 2) $b^3 - 8 = (b - 2)(b^2 + 2b + 4)$
- 3) $4x^2 + 14x - 30 = 2(2x - 3)(x + 5)$

- ⑥ Express the area of the coloured part in the given figure as a product two factors .



$$(9 - x)(9 + x)$$

- 7 Find the arithmetic mean of the following frequency distribution :

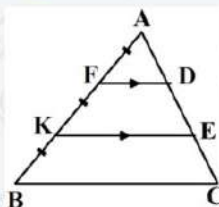
Intervals	5-	15-	25-	35-	Total
frequency	6	8	k	2	20

$K=4$ $\bar{x} = 21$

Model (3)

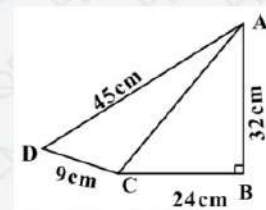
Question 1 : Choose the correct answer :

- 1 What is the result of $5^2 + 5^2$?
 (a) 10^2 (b) 10^4 (c) 5^4 (d) **50**
- 2 $X^2 - aX + bX - ab = \dots\dots\dots$
 (a) $(X - a)(X - b)$ (b) **$(X - a)(X + b)$**
 (c) $(X + a)(X - b)$ (d) $(X + a)(X + b)$
- 3 $Xy + 5X + 7y + 35 = (X + a)(y + b)$, what is the value of $a - b$?
 (a) **2** (b) -2 (c) 12 (d) -12
- 4 In the given figure: If $AC = 12$ cm, what is the length of $\overline{AE}$?
 (a) 3 cm (b) 4 cm
 (c) 6 cm (d) **8 cm**
- 5 If C belongs to the axis of symmetry of $\overline{AB}$, then what is the value of $AC - BC$?
 (a) **Zero** (b) 1 (c) 2 (d) 4
- 6 If the upper limit of an interval is 18 and its center is 15.5, what is the lower limit of this interval?
 (a) 12 (b) 12.5 (c) **13** (d) 13.5
- 7 If $\sum f = 50$, $\sum (f \cdot x_m) = 800$, what is the arithmetic mean $\bar{X}$?
 (a) **16** (b) 160 (c) 750 (d) 850
- 8 If $\triangle ABC \cong \triangle LMN$, $m(\angle C) = 90^\circ$, then $m(\angle L) + m(\angle M) = \dots\dots\dots$
 (a) 45° (b) **90°** (c) 180° (d) 120°
- 9 $5 + 7\sqrt{2} - 4 + \sqrt{2} = \dots\dots\dots$
 (a) 15 (b) $1 + 7\sqrt{2}$ (c) **$1 + 8\sqrt{2}$** (d) $1 + 6\sqrt{2}$



Question 2 : Answer the following questions :

- ① In the given figure : ABCD is a quadrilateral where $m(\angle B) = 90^\circ$, $AB = 32$ cm, $BC = 24$ cm, $CD = 9$ cm, $AD = 45$ cm Prove that: $\triangle ACD$ is an obtuse angled triangle.



$$\begin{aligned} \therefore AC^2 &= AB^2 + BC^2 \\ &= 32^2 + 24^2 = 1600 \\ \therefore AC &= \sqrt{1600} = 40 \text{ cm} \\ AD^2 &= 45^2 = 2025 \\ AC^2 + CD^2 &= 40^2 + 9^2 = 1681 \\ \therefore AD^2 &> AC^2 + CD^2 \\ \therefore \triangle ACD &\text{ is an obtuse triangle} \end{aligned}$$

- ② If $a = \sqrt{3} + \sqrt{2}$, $b = \frac{1}{\sqrt{3} + \sqrt{2}}$ find the value of the expression in

the simplest form: $\frac{(a-b)^2}{ab} = \frac{(\sqrt{3} + \sqrt{2} - \sqrt{3} + \sqrt{2})^2}{(\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2})} = 8$

- ③ Simplify to the simplest form :- $\frac{(\sqrt{5})^n \times (\sqrt{3})^{2-n}}{3 \times (\sqrt{15})^{-n}}$, then find the numerical value of the result when $n = -2$

$$= (\sqrt{5})^{2n}, \frac{1}{25}$$

- ④ Factorize each of the following completely:

- 1) $X^2 + X - 42 = (x + 7)(x - 6)$
- 2) $25 - 9X^2 = (5 - 3x)(5 + 3x)$
- 3) $14a(X + y) - 21b(X + y) = 7(x + y)(2a - 3b)$

- 5 The given table shows the frequency distribution of marks of 60 students in the mathematics test: Find the value of k , then draw the ascending cumulative frequency curve, and estimate the median.

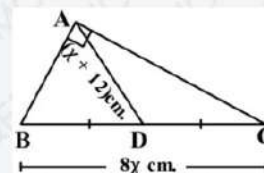
$$= k = 13$$

$$\text{The median} \approx 22.5$$

Marks	Frequency
5-	2
10-	5
15-	14
20-	20
25-	K
30-	5
35-	1
Total	60

- 6 In the given figure : $\triangle ABC$ is right-angled at A, $\overline{AD}$ is its median. Find: The length of $\overline{AD}$.

$$= 16 \text{ cm}$$



- 7 Find using the number line:

$$1) [2, 7] - [3, 8] = [2, 3]$$

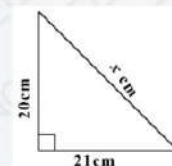
$$2)]3, \infty[\cap]-\infty, 7[=]3, 7[$$

$$3)]-\infty, 3[\cap]3, \infty[$$

Model (4)

Question 1 : Choose the correct answer :

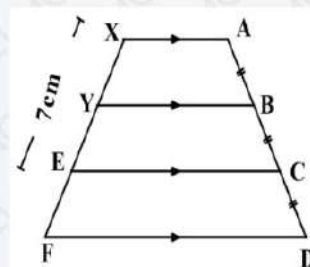
- 1 What is the number of medians in an obtuse-angled triangle ?
 (a) 0 (b) 1 (c) 2 (d) 3
- 2 Which of the following represents the factorization of the polynomial $5X - 6 - X^2$?
 (a) $(X-2)(X-3)$ (b) $(X+2)(X+3)$
 (c) $-(X+2)(X+3)$ (d) $-(X-2)(X-3)$
- 3 If $X^3 + 27 = (X + 3)(X^2 + k + 9)$, what is the value of k ?
 (a) $-6x$ (b) $-3x$ (c) $3x$ (d) $6x$
- 4 In the given figure : What is the value of X ?
 (a) 41 (b) 29 (c) $\sqrt{41}$ (d) $\sqrt{29}$



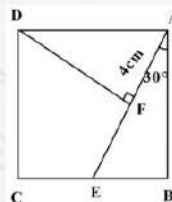
- 5 The set of non-negative real numbers is
 (a) $]0, \infty[$ (b) $]-\infty, 0[$ (c) $[0, \infty[$ (d) $]-\infty, 0]$
- 6 $6a - 8b = \dots\dots\dots$
 (a) $6(a - 2b)$ (b) $4(2a - 4b)$ (c) $2(3a - 4b)$ (d) $14(a - b)$
- 7 When completing the square for $(X^2 + 9)$, we add
 (a) $\pm x$ (b) $\pm 6x$ (c) $\pm 9x$ (d) ± 12
- 8 If $X^2 - a = (X - 4)(X + 4)$, what is the value of a ?
 (a) -16 (b) 16 (c) -8 (d) 8
- 9 In ΔABC , if $m(\angle A) = m(\angle B) \neq 60^\circ$, what is the number of its axes of symmetry?
 (a) 0 (b) 1 (c) 2 (d) 3

Question 2 : Answer the following questions :

- 1 Simplify to its simplest form : $\frac{(10)^{2n} \times 0.001}{(10)^{-n+1} \times 100}$,
 then find the value of the result when $n = 2$.
 $= (10)^{3n-6} = (10)^{3 \times 2 - 6} = (10)^0 = 1$
- 2 [a] : Use factorizing to facilitate the calculation of the value of each of the following:
 1) $(8.27)^2 - (1.73)^2 = 65.4$
 2) $(101)^2 - 2 \times 101 + 1 = 10,000$
 [b] Factorize each of the following completely:
 1) $(X - y)^2 + 4Xy = (x + y)^2$
 2) $X^4 + 8X = x(x + 2)(x^2 - 2x + 4)$
- 3 Determine the type of the triangle based on its angles if the lengths of its sides are 6 cm, 5 cm, 7 cm.
Acute - angled triangle
- 4 In the given figure: Find with proof: The length of $\overline{XF}$
 $= 10.5 \text{ cm}$
 $xy = ye = ef = 3.5$



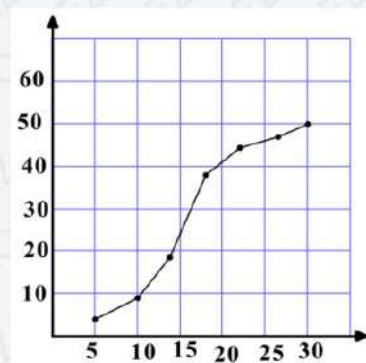
- 5 In the given figure :
ABCD is a square, $AF = 4 \text{ cm}$,
 $\overline{DF} \perp \overline{AE}$, $m(\angle BAE) = 30^\circ$
Find: 1) The length of $\overline{DF} = 4\sqrt{3} \text{ cm}$
2) The area of the square ABCD = 64 cm^2



- 6 The following frequency table shows the frequency distribution of the number of vacation days for 50 workers:

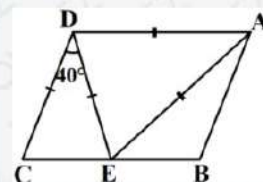
Marks	2-	6-	10-	14-	18-	22-	26-
Frequency	4	5	8	$K - 2$	7	5	1

- 1) Find the value of $k = 22$
2) Form the ascending cumulative frequency table and represent it graphically.



- 3) What is the percentage of workers whose vacations are less than 10 days? 18%

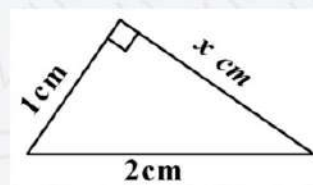
- 7 In the given figure: ABCD is a parallelogram, $E \in \overline{BC}$
where $AE = AD$, $DE = DC$, $m(\angle CDE) = 40^\circ$
Find: 1) $m(\angle AED) = 70^\circ$
2) $m(\angle BAE) = 30^\circ$



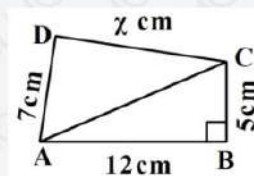
Model (5)

Question 1 : Choose the correct answer :

- 1 The centroid of the triangle divides each median in the ratio from the vertex.
(a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 2 : 3
- 2 In the given figure: What is the value of X?
(a) 1 (b) 3 (c) $\sqrt{5}$ (d) $\sqrt{3}$

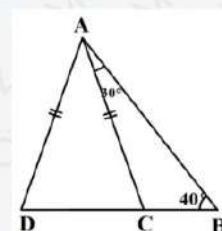


- 3 Which of the following numbers is irrational ?
 (a) $0.\bar{3}$ (b) $\sqrt{\frac{9}{25}}$ (c) $\sqrt{5}$ (d) $\sqrt[3]{-125}$
- 4 In the given figure: If $\overline{AB} \perp \overline{CB}$, $AB = 12$ cm, $BC = 5$ cm, $AD = 7$ cm, $DC = X$ cm, then $X \in \dots\dots\dots$
 (a) $[6,13[$ (b) $]6,20[$ (c) $[13,20]$ (d) $[6,20]$
- 5 If the polynomial $(16X^2 - 40X + k^2)$ is a perfect square, what is the value of k ?
 (a) 5 (b) -5 (c) ± 5 (d) 8
- 6 $49ab + 14b^2 = 7b(\dots\dots\dots)$
 (a) $7b + 2a$ (b) $7a + 2b$ (c) $42a + 7b$ (d) $14ab$
- 7 What is the result of $[1,3] - \{1,3\}$?
 (a) $]1,3[$ (b) $[1,3[$ (c) $] - 3, -1[$ (d) $] - 1,3[$
- 8 If $\triangle ABC \cong \triangle XYZ$, $m(\angle B) + m(\angle C) = 100^\circ$, then $m(\angle X) = \dots\dots\dots$
 (a) 40° (b) 50° (c) 80° (d) 100°
- 9 If $\sqrt[3]{40} = a\sqrt[3]{5}$, what is the value of a ?
 (a) 8 (b) 2 (c) 5 (d) 40



Question 2 : Answer the following questions :

- 1 In the given figure : $AC = AD$, $m(\angle B) = 40^\circ$, $m(\angle BAC) = 30^\circ$ Find by proof:
 1) $m(\angle D) = 70^\circ$
 2) $m(\angle CAD) = 40^\circ$
- 2 Simplify to the simplest form: $\frac{7}{3}\sqrt{18} + \sqrt[3]{54} - 7\sqrt{2} + \sqrt[3]{16}$
 $= 5\sqrt[3]{2}$



- ③ A rectangular prism with dimensions $2\sqrt{2}$ cm, 7 cm, $5\sqrt{2}$ cm. Calculate its total area and volume.

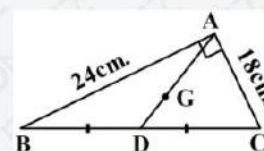
The total area = $(40 + 98\sqrt{2})\text{cm}^2$
The volum = 140 cm^3

- ④ If the total area of a cube is 240 cm^2 , then find the length of its edge to the nearest centimeter.? = 6 cm

- ⑤ Use factorizing to facilitate the calculation of each of the following:

- 1) $(999)^2 + 2 \times 999 + 1 = 1,000,000$
2) $(1.6)^2 - (1.4)^2 = 0.6$
3) $123 \times 14 + 123 \times 37 - 123 = 6150$

- ⑥ In the given figure:
If G is the centroid of the triangle ABC,
 $\triangle ABC$ is right-angled at A
Find: The length of $\overline{AG} = 10\text{ cm}$



- ⑦ The following table shows the frequency distribution of wages in pounds for some workers in a factory:

Wage Intervals	500-	600-	700-	800-	900-	Totle
Number of Workers	8	K	18	7	5	50

Find the value of k, then estimate the mode.

$K = 12$

The mode $\cong 735$

Model (6)

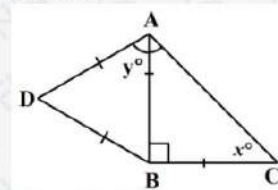
Question 1 : Choose the correct answer :

- ① The number of medians of the right-angled triangle is

(a) 0 (b) 1 (c) 2 (d) 3

- 2 In the given figure: $AD = DB = AB = BC$, $m(\angle ABC) = 90^\circ$ What is the value of $X + y$?

(a) 45 (b) 60
(c) 120 (d) 150

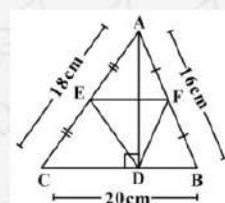


- 3 What is the center of the first interval in the intervals: 5-, 15-, 25-, 35-?

(a) 5 (b) 10 (c) 15 (d) 20

- 4 In the given figure: The perimeter of $\triangle FDE = \dots\dots\dots$ cm

(a) 37 (b) 54
(c) 18 (d) 27



- 5 $(2\sqrt[3]{2})^3 = \dots\dots\dots$

(a) 4 (b) 8 (c) 16 (d) 40

- 6 If $(X + 1)$ is one of the factors of the trinomial $(5X^2 - 2X - 7)$, what is the other factor?

(a) $7x - 5$ (b) $7x + 5$ (c) $5x + 7$ (d) $5x - 7$

- 7 If the polynomial $(X^2 + kX + 36)$ is a perfect square, what is the value of k ?

(a) +6 (b) ± 8 (c) ± 12 (d) ± 18

- 8 If $\triangle ABC$ has one axis of symmetry, $m(\angle ABC) = 140^\circ$, what is $m(\angle A)$?

(a) 30° (b) 20° (c) 40° (d) 60°

- 9 If $X + y = 6$, $X^2 - y^2 = 12$, what is the value of $X - y$?

(a) 4 (b) 6 (c) 2 (d) -2

Question 2 : Answer the following questions :

- 1 If $a = \sqrt[3]{5} + \sqrt[3]{2}$, $b = \sqrt[3]{5} - \sqrt[3]{2}$, find in the simplest form each of the following:

1) $(a + b)^3 = 40$
2) $a \times b = \sqrt[3]{25} - \sqrt[3]{4}$

- 2 Factorize each of the following completely:

1) $6X^2 + 7X + 2 = (2x + 1)(3x + 2)$
2) $(a + b)^2 - 4 = (a + b + 2)(a + b - 2)$
3) $X^4 + 2X^3 - 9X^2 - 18X = x(x - 3)(x + 3)(x + 2)$

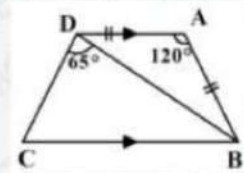
3

In the given figure:

$AB = AD, \overline{DA} \parallel \overline{CB}, m(\angle BDC) = 65^\circ, m(\angle A) = 120^\circ$

Find: 1) $m(\angle ADB) = 30^\circ$

2) $m(\angle C) = 85^\circ$

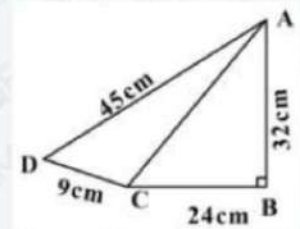


4

In the given figure : ABCD is a quadrilateral where $m(\angle B) = 90^\circ$,

$AB = 32 \text{ cm}, BC = 24 \text{ cm}, CD = 9 \text{ cm}, AD = 45 \text{ cm}$

Prove that: $\triangle ACD$ is an obtuse angled triangle.



$$\therefore AC^2 = AB^2 + BC^2$$

$$= 32^2 + 24^2 = 1600$$

$$\therefore AC = \sqrt{1600} = 40 \text{ cm}$$

$$AD^2 = 45^2 = 2025$$

$$AC^2 + CD^2 = 40^2 + 9^2 = 1681$$

$$\therefore AD^2 > AC^2 + CD^2$$

$\therefore \triangle ACD$ is an obtuse triangle

5

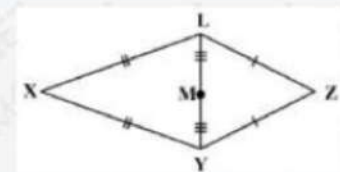
Simplify to the simplest form: $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}} = \frac{4^n \times 2^{2n} \times 3^{2n}}{2^{4n} \times 3^{2n}} = 1$

6

In the given figure:

$XL = XY, ZL = ZY, ML = MY$

Prove that: X, M and Z are collinear.



In $\triangle ZLY : \because ZL = ZY, ML = MY$

$\therefore \overline{ZM}$ is an axis of symmetry of $\triangle LY$

Similarly in $\triangle XLY :$

$\therefore \overline{XM}$ is an axis of symmetry of $\triangle LY$

$\therefore X, M, Z$ are on a straight line

- 7 The following table shows the frequency distribution of marks of 40 students in one of the tests:

Intervals	5-	15-	25-	35-	45-	Total
Frequency	3	K	12	10	5	40

Find the value of k , then estimate the arithmetic mean.

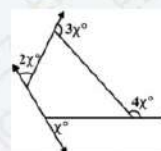
$K = 12$

$\bar{x} = 31$

Model (7)

Question 1 : Choose the correct answer :

- 1 If $3^X = 2$, what is the value of 3^{X-1} ?
- (a) 1 (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) 6
- 2 $aX + aY - bX - bY = \dots\dots\dots$
- (a) $(X - Y)(a - b)$ (b) $(X + Y)(a + b)$
(c) $(X - Y)(a + b)$ (d) $(X + Y)(a - b)$
- 3 If the lower limit of an interval is 10 and the upper limit is X and its center is 15, what is the value of X?
- (a) 5 (b) 12.5 (c) 20 (d) 25
- 4 In the given figure: What is the value of X?
- (a) 360 (b) 40
(c) 36 (d) 18
- 5 If the polynomial $(16y^2 + ky + 1)$ is a perfect square, what is the value of k?
- (a) -8 (b) 8 (c) ± 8 (d) ± 4
- 6 What is the convex polygon that has no diagonals?
- (a) The hexagon (b) The pentagon (c) The quadrilateral (d) The triangle
- 7 What is the estimate of the number $\sqrt[3]{36}$ to the nearest integer?
- (a) 3 (b) 4 (c) 5 (d) 6
- 8 What is the measure of the interior angle of a regular hexagon ?
- (a) 60° (b) 108° (c) 120° (d) 135°



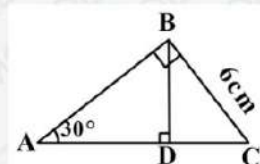
- 9 If $X^2 - a = (X-5)(X+5)$, what is the value of a ?
- (a) -25 (b) 25 (c) -10 (d) 10

Question 2 : Answer the following questions :

- 1 If $X = [-2, 1[$, $Y = [1, 4[$, find using the number line each of the following:

- 1) $X \cap Y = \emptyset$
2) $Y - X = [1, 4[$

- 2 In the given figure:
ABC is a right-angled triangle at B, $m(\angle A) = 30^\circ$,
 $BC = 6 \text{ cm}$, $\overline{BD} \perp \overline{AC}$
Find: The length of $\overline{AD} = 9 \text{ cm}$



- 3 Find the solution set of each of the following two equations in R:

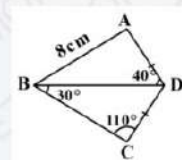
1) $16X^2 - 3 = 4x^2 + 7$

2) $X^2 - 6X = -8$

1) The solutionset = $\{\sqrt{5}, -\sqrt{5}\}$

2) The solutionset = $\{2, 4\}$

- 4 In the given figure:
 $AD = CD$, $m(\angle ADB) = 40^\circ$, $m(\angle C) = 110^\circ$
 $m(\angle DBC) = 30^\circ$, $AB = 8 \text{ cm}$
Find with proof: 1) The length of $\overline{BC} = 8 \text{ cm}$



2) $m(\angle ABC) = 60^\circ$

- 5 In the given figure:
 $\overline{AC} \parallel \overline{DE}$, $\overline{AB} \parallel \overline{DC}$, $\overline{BC} \cong \overline{CE}$

Prove that: $\triangle ABC \cong \triangle DCE$

$\therefore \overline{AB} \parallel \overline{DC}$, $\overline{BE}$ is a transversal :

$\therefore m(\angle ABC) = m(\angle DCE)$ (1)

(corresponding angles)

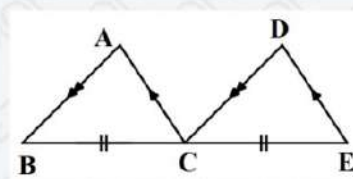
$\therefore \overline{AC} \parallel \overline{DE}$, $\overline{BE}$ is a transversal :

$\therefore m(\angle ACB) = m(\angle DEC)$ (2)

(corresponding angles)

, $\therefore BC = CE$

(3)



From (1), (2), (3) :
 $\therefore \triangle ABC \cong \triangle DCE$

⑥ Find the solution set of each of the following equations in R:

1) $X^2 - 9x + 18 = 0$

2) $9X^2 + 5 = 24X$

1) $s.s = \{3, 6\}$

2) $s.s = \left\{ \frac{4-\sqrt{11}}{3}, \frac{4+\sqrt{11}}{3} \right\}$

⑦ The following table shows the frequency distribution of the marks of 100 students in one of the tests:

Intervals	10-	20-	30-	40-	50-	Total
Frequency	16	24	30	20	10	100

Estimate the value of the median.

The median = $33\frac{1}{3}$

Model (8)

Question 1 : Choose the correct answer :

① If $\angle A$ complements $\angle B$ in the triangle ABC, then $(AC)^2 + (BC)^2 \dots\dots\dots (AB)^2$

(a)

(b) $<$

(c) $>$

(d) $\neq$

② If $(2X + 3y)$ is one of the factors of the trinomial $(6X^2 + 13Xy + 6y^2)$, what is the an other factor?

(a) $(6X + 6y)$

(b) $(2X + 3y)$

(c)

(d) $(X + 3y)$

③ If $3X - 3y = 27$, what is the value of $y - X$?

(a) 24

(b) 9

(c)

(d) 3

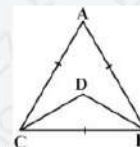
④ In the given figure: ABC is an equilateral triangle, $\angle C$ and $\angle B$ are bisected by two bisectors that meet at D, then $m(\angle BDC) = \dots\dots\dots$

(a) 60°

(b) 90°

(c) 108°

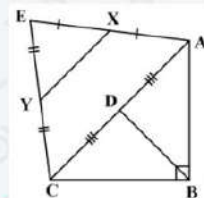
(d)



- 5 If the polynomial $(kX^2 - 14X + 49)$ is a perfect square, what is the value of k ?
 (a) 49 (b) ± 7 (c) -1 (d) **1**
- 6 If $\Sigma f = 30$, $\Sigma(f \cdot X) = 960$, what is the arithmetic mean $\bar{X}$?
 (a) **32** (b) 320 (c) 930 (d) 990
- 7 If the projection of the point $(25, 40)$ which lies on the ascending cumulative frequency curve on the horizontal axis determines the median, what is the value of the median?
 (a) **25** (b) 40 (c) 80 (d) 50
- 8 If $X + y = 2$, $X^2 - Xy + y^2 = 8$, what is the value of $X^3 + y^3$?
 (a) **16** (b) 10 (c) 6 (d) 4
- 9 The set of non-positive real numbers is
 (a) $] 0, \infty [$ (b) $] -\infty, 0 [$ (c) $[0, \infty [$ (d) **$] -\infty, 0]$**

Question 2 : Answer the following questions :

- 1 In the given figure:
 X, Y and D are the midpoints of $\overline{EA}$, $\overline{EC}$ and $\overline{AC}$ respectively,
 $m(\angle ABC) = 90^\circ$



Prove that: $BD = YX$

Since X and Y are the midpoints of EA and EC respectively,
 the segment XY is parallel to AC , and its length is half the length of AC .

$$XY = \frac{1}{2} AC$$

In the right-angled triangle ABC , where $\angle ABC = 90^\circ$, BD is the median to the hypotenuse AC .

$$AD = \frac{1}{2} AC$$

Therefore, $BD = XY$

- 2 Factorize each of the following completely:

1) $X^2 + 7X + 12 = (x + 3)(x + 4)$

2) $3X^3 + 24 = 3(x + 2)(x^2 - 2x + 4)$

3) $7X - 28 + aX - 4a = (x - 4)(7 + a)$

3

[a] Find in the simplest form: $\sqrt[3]{54} + 4\sqrt[3]{\frac{1}{4}} - \sqrt[3]{2} = 4\sqrt[3]{2}$

[b] If $A =] -1, 3]$, $B = [0, 5 [$, find each of the following:

1) $A \cap B = [0, 3]$

2) $B - A =]3, 5[$

4

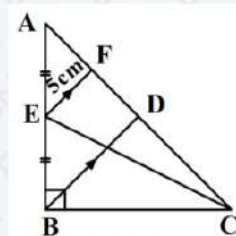
In the given figure:

If ABC is a right-angled triangle at B in which

$\overline{BD}$ and $\overline{CE}$ are two medians ,

$\overline{EF} \parallel \overline{BD}$, $EF = 5$ cm.

Find with proof: The length of $\overline{AC} = 20$ cm



5

If $x = \sqrt{5} - \sqrt{3}$, $y = \frac{2}{\sqrt{5} - \sqrt{3}}$, what is the value of: $x^2 + y^2 = 16$

6

In the given figure:

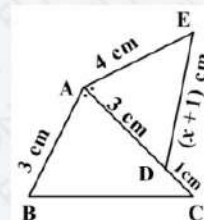
Prove that: $\triangle ABC \cong \triangle ADE$

In $\triangle ABC, \triangle ADE$:

$AB = AD, AC = AE$

$m(\angle BAC) = m(\angle DAE)$

$\therefore \triangle ABC \cong \triangle ADE$



7

Using the following frequency distribution table:

Intervals	5-	15-	25-	35-	45-	Total
Frequency	7	9	12	K	4	40

1) Find the value of k

2) Estimate the median.

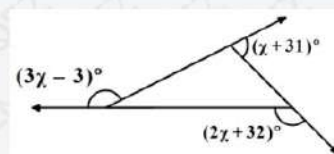
1) $k = 8$

2) $28\frac{1}{3}$

Model (9)

Question 1 : Choose the correct answer :

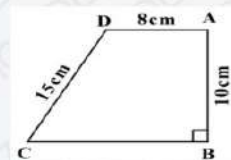
- 1) $X^{m-1} \times \dots = 1, X \neq 0$
 (a) X^{m-1} (b) X^{-m-1} (c) X^{m+1} (d) X^{-m+1}
- 2) If the polynomial $(9X^2 + 30X + k^2)$ is a perfect square, what is the value of k ?
 (a) -5 (b) 5 (c) ± 25 (d) ± 5
- 3) If $a^2 - b^2 = 16, a - b = 4$, what is the value of $\sqrt{a+b}$?
 (a) 2 (b) $+4$ (c) 8 (d) 16
- 4) In the given figure: What is the value of X ?
 (a) 50 (b) 20 (c) 5 (d) 2
- 5) $\{3, 4, 5\} -]3, 5[= \dots$
 (a) $\emptyset$ (b) $\{3, 5\}$ (c) $\{4\}$ (d) $[3, 5]$
- 6) If $X \in [-3, 4]$, then $X^2 \in \dots$
 (a) $[9, 16]$ (b) $[0, 9]$ (c) $[0, 16]$ (d) $[-9, 0]$
- 7) If $a^2 + 2ab + b^2 = 36$, what is the value of $a + b$?
 (a) 6 (b) -6 (c) ± 6 (d) 18
- 8) When completing the square for $(X^2 + 36)$, we add
 (a) $\pm 3X$ (b) $\pm 6X$ (c) $\pm 9X$ (d) $\pm 12X$
- 9) If the point M is the centroid of the triangle ABC , $\overline{BD}$ is a median, then $BD : MD = \dots$
 (a) $2 : 3$ (b) $1 : 3$ (c) $3 : 2$ (d) $3 : 1$



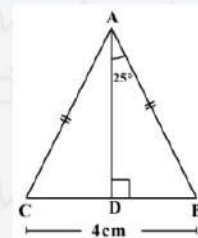
Question 2 : Answer the following questions :

- 1) Factorize each of the following completely:
 1) $-x^2 + 3x + 40 = -(x - 8)(x + 5)$
 2) $4m^4 + 1 = (2m^2 + 2m + 1)(2m^2 - 2m + 1)$
 3) $a(b + 5) + 2(b + 5) = (b + 5)(a + 2)$

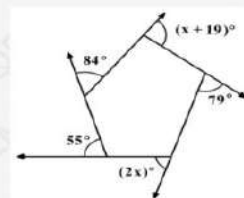
- 2 In the given figure:
ABCD is a trapezoid right-angled at B. $AD = 8 \text{ cm}$,
 $DC = 15 \text{ cm}$, $AB = 10 \text{ cm}$
Find: The area of the trapezoid ABCD.
 $= (80 + 25\sqrt{5}) \text{ cm}^2$



- 3 In the given figure:
In $\triangle ABC$, $AB = AC$, $\overline{AD} \perp \overline{BC}$,
 $m(\angle BAD) = 25^\circ$, $BC = 4 \text{ cm}$
Find : 1) $m(\angle DAC) = 25^\circ$
2) The length of $\overline{DC} = 2 \text{ cm}$



- 4 From the given figure:
Find: The value of $X = 41$



- 5 [a] Simplify to the simplest form: $\frac{(\sqrt{6})^{n+2} \times (\sqrt{3})^n}{4 \times (\sqrt{2})^{n+2}} = (\sqrt{3})^{2n+2}$

[b] Find the solution set in R of each of the following:

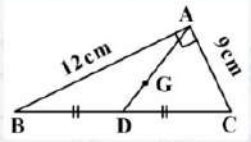
- 1) $2x^3 + 13 = 67$
2) $4x^2 + 1 = 4x$
1) The solution set = $\{3\}$
2) The solution set = $\left\{\frac{1}{2}\right\}$

- 7 Using the following frequency distribution table, find the mean value:

Intervals	5-	15-	25-	35-	45-	Total
Frequency	4	5	6	3	2	20

The mean = 27

Question 1 : Choose the correct answer :

- ① What is the multiplicative inverse of the number $\sqrt{5}$ in its simplest form?
 (a) -5 (b) $-\frac{1}{5}$ (c) $\frac{5}{\sqrt{5}}$ (d) $\frac{\sqrt{5}}{5}$
- ② If the upper limit of an interval is 18 and its center is 15, what is the lower limit of this interval?
 (a) 12 (b) 12.5 (c) 13 (d) 13.5
- ③ If $X^2 - y^2 = 20$, $X + y = 10$, what is the value of $y - X$?
 (a) 10 (b) 2 (c) -2 (d) -10
- ④ In the given figure: If G is the centroid of $\triangle ABC$, $\triangle ABC$ is right-angled at A, then the length of $\overline{AG} = \dots\dots\dots$ cm
 (a) 15 (b) 7.5
 (c) 5 (d) 2.5
 
- ⑤ If $X + b = 3$, $X^2 + a = 4$, what is the numerical value of the polynomial $X^3 + bX^2 + aX + ab$?
 (a) 1 (b) 7 (c) 12 (d) 36
- ⑥ If the lengths of two sides in an isosceles triangle are 3 cm and 4 cm, then its largest angle is
 (a) acute (b) Right (c) Obtuse (d) straight
- ⑦ If $X + 2y = 7$, what is the value of $2X + 4y$?
 (a) 14 (b) 18 (c) 28 (d) 56
- ⑧ What is the half of the number 2^{14} ?
 (a) 2^{12} (b) 2^{13} (c) 4^8 (d) 2^{12}
- ⑨ If $X = \frac{\sqrt{9}}{\sqrt{3}}$, what is the value of X^{-1} ?
 (a) $\frac{\sqrt{3}}{3}$ (b) $\frac{\sqrt{9}}{\sqrt{2}}$ (c) $\sqrt{3}$ (d) 2

Question 2 : Answer the following questions :

① If $a = \sqrt{3} + \sqrt{2}$, $b = \frac{1}{\sqrt{3} + \sqrt{2}}$

Find in the simplest form the value of: $(a - b)^2$

$$= (\sqrt{3} + \sqrt{2} - \sqrt{3} + \sqrt{2})^2 = 8$$

② Find in R the solution set of each of the following equations:

1) $x^2 - 11 = 5$

2) $x^2 - 15 = 2x$

1) $s.s = \{-4, 4\}$

2) $s.s = \{-3, 5\}$

③ The dimensions of a rectangle are $(6 + \sqrt{5})$ cm and $(6 - \sqrt{5})$ cm, calculate its area.

$$A = (6 + \sqrt{5})(6 - \sqrt{5}) = 31 \text{ cm}^2$$

④ In the given figure:

ABCD is a quadrilateral where $m(\angle B) = 90^\circ$,

AB = 3 cm, BC = 4 cm, AD = 13 cm, CD = 12 cm

Prove that: $m(\angle ACD) = 90^\circ$

$\therefore \triangle ABC$ is right-angled at B

$$\therefore (AC)^2 = (AB)^2 + (BC)^2 = 3^2 + 4^2 = 25$$

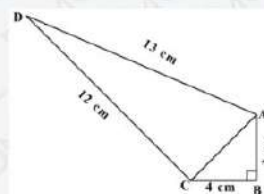
$$\therefore AC = \sqrt{25} = 5 \text{ cm}$$

$$\text{In } \triangle ACD : \therefore (AD)^2 = (13)^2 = 169$$

$$, (AC)^2 + (CD)^2 = (5)^2 + (12)^2 = 169$$

$$\therefore (AD)^2 = (AC)^2 + (CD)^2$$

$$\therefore m(\angle ACD) = 90^\circ$$



5

In the given figure:

ABCD is a quadrilateral where: $m(\angle B) = 90^\circ$,
AB = 9 cm, BC = 12 cm, CD = 17 cm, AD = 8 cm.

Prove that: $m(\angle DAC) = 90^\circ$

Then find: The area of the figure ABCD.

In $\triangle ABC$:

$$\therefore m(\angle B) = 90^\circ$$

$$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (9)^2 + (12)^2 = 225$$

$$\therefore AC = \sqrt{225} = 15$$

In $\triangle ACD$:

$$\therefore (CD)^2 = (17)^2 = 289$$

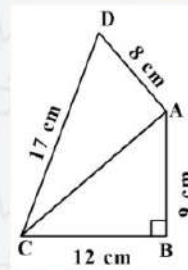
$$\therefore (AD)^2 + (AC)^2 = (8)^2 + (15)^2 = 289$$

$$\therefore m(\angle DAC) = 90^\circ$$

, the area of figure ABCD

= The area of triangle ABC + The area of triangle ACD

$$= \frac{1}{2} \times 9 \times 12 + \frac{1}{2} \times 8 \times 15 = 114 \text{ cm}^2$$



6

Simplify each of the following to the simplest form:

1) $\sqrt{5} - \sqrt{3} + 2\sqrt{5} + \sqrt{3} = 3\sqrt{5}$

2) $\frac{x^2 \times x^{-3}}{x^{-4} \times x} = x^2$

7

The following table shows the frequency distribution of marks for 40 students in one of the tests:

Intervals	5-	15-	...	35-	45-	Total
Number of students	3		12	10	5	40

1) Complete the table.

2) Estimate the arithmetic mean.

2) Find the number of students whose marks are not less than 35

Intervals	5-	15-	25-	35-	45-	Total
Number of students	3	10	12	10	5	40

1) Complete the table.

2) Estimate the arithmetic mean = 31

2) Find the number of students whose marks are not less than 35 = 15

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9

